THIS WEEK IN THE

IRON AGE

Vol. 158, No. 10 September 5, 1946

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To Keep Them Flying

ONE of the greatest assets possessed by our American armed forces abroad in the late war was the tremendous number of automobiles in use at home. There were comparatively few American boys in our Army who had not, previous to their induction, learned how to drive a car or truck. Many of them indeed had become "motor conscious" to the point where they could diagnose an ignition ill or give first aid to a balky engine.

When one considers that mobility was one of the chief strategic factors; not only mobility of men but also of the tremendous flood of supplies necessary to back them up, this familiarity of man with machine in connection with motor transportation gave our boys and our Army, the "edge" on rapid land movement.

How did we get that edge? Not through military indoctrination, but simply because America, beyond any other nation in the world, had put itself on wheels activated by power.

We did not think of this evolution, as it was occurring, as a preparation for war. As a peace loving nation it is not in our nature to appraise economic or industrial developments from the standpoints either of offensive or defensive action. But as intelligent people, who through experience must learn to be realistic if we wish to survive, we must take cognizance of the advantage we had through this unsought relationship between peace purpose and war purpose power. And also of the fact that war has been "moved upstairs."

In the Napoleonic wars, armies moved "on their bellies" with marching range of the foot soldier determining daily horizons. In our Civil War, the mule was the emperor of logistics. This last war brought mechanized transportation into the foreground and a vision of things to come in connection with guided missiles, flying electronic robots, supersonics and atomics. "Get there fustest with the mostest" is still and always will be the first axiom of successful combat, and today and tomorrow it will mean getting there by air.

During this war we spent billions of dollars in training hundreds and thousands of our young men as flyers. We made them air conscious and once that, they will never lose the bird urge. But we have clipped their wings.

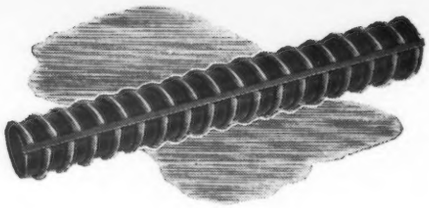
How many of these young fellows, now that they are out of service, can still afford to fly and thus preserve their technique? In the interest of national defense, we should make it possible for them to do that.

One way would be to preserve an enormous government air force, but that is not the American way. Its cost would be prohibitive, not only from the standpoint of military appropriations, but beyond that from its cost in international relations.

The simple way to do it is to enable these young men of ours as civilians to acquire wings by putting the cost of planes within their reach. Bring the cost of a flivver plane down to the cost of a low cost car and you will automatically multiply demand and use by a tremendous factor.

We thought it expedient to subsidize butter, milk and other commodities that Americans needed for current consumption during the war emergency. But what we ate and drank yesterday is not going to preserve us tomorrow.

Why not subsidize the production of low cost planes to encourage their private ownership and operation? It would be a temporary investment for cost and price always respond to volume. And some day, American air consciousness may stand us in as good stead as did the motor car consciousness of our people in the last World War.



Construction Industry Gains by Inland Action

New Licensing Program Increases Availability of HI-BOND Reinforcing Bars*

Inland Steel Company, realizing the tremendous demand for its Hi-Bond Reinforcing Bar for necessary post war construction, is granting licenses to other steel manufacturers to make this greatly improved reinforcing bar. We believe this announcement will be good news to thousands of architects, engineers, and contractors.

With manufacturing licenses being granted to other plants, greater tonnage of this superior reinforcing bar will be made available for increased construction from coast to coast. The construction industry will now have more Hi-Bond for use in buildings, bridges, dams, highways, and other reinforced concrete structures.

Write for a copy of the bulletin on Inland Hi-Bond Bars.

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CONCRETE REINFORCING BARS

► Steel sources, all too familiar with the original priority system instituted during the war which broke down miserably and had to be supplanted by the controlled materials plan are freely predicting that the peacetime priority system will meet the same fate. While there were only a few major priorities during the early stages of reconversion, the number is increasing rapidly. Weakness in the present system is the fact that priorities are on a company, rather than a quantity basis.

► Concrete bars join the list which some steelmakers are completely eliminating from their schedules. One large producer has already cut output to the bone, is toying with the idea of making none. This situation, created by the low price of reinforcing bars compared to other products, will be in the limelight soon when major building projects are completely stymied.

► As of Aug. 15, the Navy had declared surplus 4788 tons, or 120 freight car loads, of badly-needed nails.

► As indicated on this page earlier this year, efforts by bituminous coal interests to find new outlets for soft coal have led to an important technological development—gas turbines fired with pulverized coal. Largely through efforts of the Locomotive Research Committee machinery is now available for pulverizing coal and removing fly ash, former stumbling blocks to use of soft coal in gas turbines. The research group has placed contracts both with Allis-Chalmers and with the Elliot Co. for 3750-hp turbines.

► A drive is on to get more work gloves on the hands of workers. OPA has hiked prices for work glove textiles; will increase ceilings on gloves. CPA has limited factory inventories to 30 days, forcing them onto the market to prevent what it called "hoarding."

► Despite the fact that tire production, now at a record high, is not expected to come into balance with demand until well into 1947, raw rubber is not expected to be a critical item. The British have been unable to absorb Malayan output which has topped government estimates, as Malayan producers predicted it would back in May. In some prewar years the Stevenson monopoly plan prevented full production in Malaya.

► ICC postponement of the date for further hearings on freight rate increases probably means railroad postponement of purchases of all but top essential maintenance and replacement supplies. The net result of a brief postponement will be insignificant since car builders lost about 60 days as a result of the strikes early this year.

► Some large automobile firms have not yet placed their fourth quarter sheet orders. There is no danger, however, of their not getting the steel. Before the war automakers were taken care of by verbal commitments with orders placed when the companies got around to it.

► Experimental tests have demonstrated a remarkable improvement in the anti-friction and antiseize properties of bearings, in the absence of lubrication, produced by extremely thin surface films of relatively soft, low melting metals on a metal of greater hardness and strength.

This has led to the hypothesis that excellent bearing qualities of copper-lead alloys result from a certain degree of extrusion of the lead particles to the surface under the pressure and sliding of the journal with the formation of a thin lubricating film of lead over the copper component of the material.

► British atomic scientists are experimenting with MP 395, radium beryllium, as an alternative to use of uranium in release of atomic energy. A small shipment of the metal, weighing only 0.6 g, recently arrived in Berkshire, England, after an unobtrusive trip by air from Canada. The "sample", containing enough potential energy to wipe out the better part of Detroit made the trip in a 100-lb lead box.

► According to the Industrial Preparedness Bulletin of the Army Ordnance Assn., improved fuels have already resulted in altitudes roughly double those achieved by the German V-2 rockets. Further improvements in fuels and combustion are expected to send the V-2 to an altitude of at least 200 miles, equivalent to a horizontal range of 3000 miles or more.

► Extraction of titaniferous magnetite with a 60-pct iron content from ferruginous sand has been accomplished in Italy. The fusion, effected in an electric furnace by the Eustacchio works in Bresica, develops a product of 99.4 pct purity, or 99.89 pct for an aluminum rimmed product.

► Among early benefits of unification of British and American occupied zones of Germany is a new order permitting freer travel between zones. The agreement does not affect travel to and from Berlin, for which quadripartite passes are still required. Reports indicate that four-power negotiations are under way for travel to all zones.

Welding Jet Engine Parts

THE welding problems encountered in production of gas turbines are typified by this nozzle diaphragm of type 347 stainless.

Procedure and fixtures employed in welding Inconel and type 347 stainless used for aircraft gas-turbine parts are described in this article. Overcoming crater cracking and cracking due to clamping are covered in detail and data on surface preparation and welding machine settings are given.

o o o

By W. J. CAMPBELL
Electric Welding Div.,
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o o o

PRINCIPLES of the gas turbine have been known for many years but practical application of this new motive power was delayed until alloys were developed which would withstand the high operating temperatures involved. These alloys[1] were required to have high strength and corrosion resistance at temperatures up to 1500° to 1800°F. In addition, it was also important that comparatively nonhardenable alloys be used, since, in this type of engine, the heating and cooling cycles are quite severe.

The latter requirements dictated the use of austenitic alloys. For the sheet metal parts in the GE type I-40 turbo-jet engine, stainless type 347 (columbium stabilized) alloy and Inconel were selected to do the job.

Selection of welding as the method of fabrication was only natural. Difficulties, however, were expected in welding these alloys. Some of the stainless alloys when heated to temperatures of 800° to 1200°F are subject to a precipitation[2] which causes some of the chromium from the grain boundaries to unite with the carbon, depleting the grain boundaries of the chromium that gives to the alloy its corrosion resistance. In the type 347 alloys, columbium[3] is added because of its greater affinity for carbon than chromium, thereby preventing the depletion of the chromium at the grain boundaries. However, this columbium addition causes a slight hot-short condition which may result in cracking during cooling. Rapid cooling will reduce the difficulties arising from this cause, and, in addition, tend to anneal the joint.

Crater-cracking may often be the start of long, harmful cracks through the center of the weld. The origin of these cracks is simliar to those causing the formation of pipes in a casting. If sufficient metal is not available to fill the crater during cooling, this piping will occur. To eliminate this type of cracking, the arc or flame should be withdrawn slowly and the crater drawn off to one side, or, in metallic arc welding, the welds back stepped. That means having the crater of each increment overlap the start of the preceding bead.

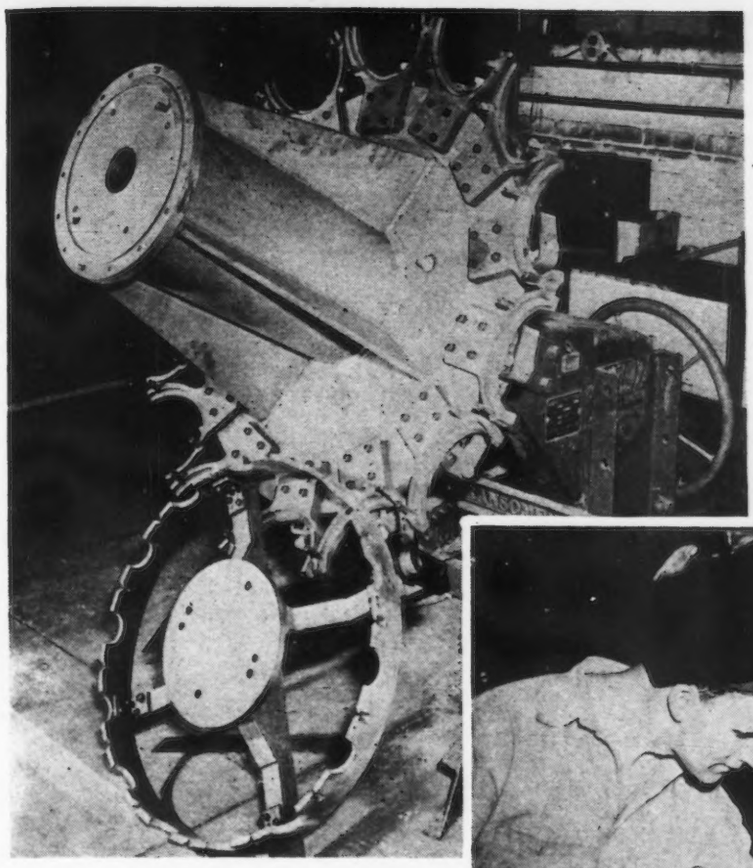
Another frequent cause of cracking, when welding a straight butt joint, is the clamping procedure. In making joints of this type on the I-40 jet engine, the pieces were clamped against the backing fixture which had a groove milled directly under the joint, and then two top clamps were positioned. If the space between the top clamp is too close, a crack may follow the arc all along the seam. By having more space between the clamp, a little more ductility is available to resist the cracking. If no crack forms, a slight reduction of thickness is obtained on both sides of the weld. This relieves the stresses and has very little effect on the strength of the joint.

Not the least of the problems encountered in welding stainless alloys is distortion, which develops to a greater extent than in the welding of carbon-steel alloys. These problems were overcome by good fixturing and planned operational sequence. Fig. 1 is an example of the fixture used for the combustion tube assembly. The plates seen in fig. 2 in the locating rings

[1] *A description of alloys used in gas turbine construction is contained in the article "Metallurgical Development of Materials for Turbosuperchargers and Gas Turbines,"* THE IRON AGE, *Aug.* 1, 1946, *p.* 60.

[2] *See "Carbon Absorption of* 18-8 *Stainless,"* THE IRON AGE, *June* 20, 1946, *p.* 56.

[3] *See "Welding Stabilized* 18-8 *Stainless,"* THE IRON AGE, *July* 11, 1946, *p.* 60 *and "Behavior of* 18-8 *Ti-Stabilized Stainless,"* THE IRON AGE, *Aug.* 8, 1946, *p.* 61 *and Aug.* 15, 1946, *p.* 54.



LEFT

FIG. 1—Assembling fixtures used to build ring and tube assembly for GE jet engine.

o o o

BELOW

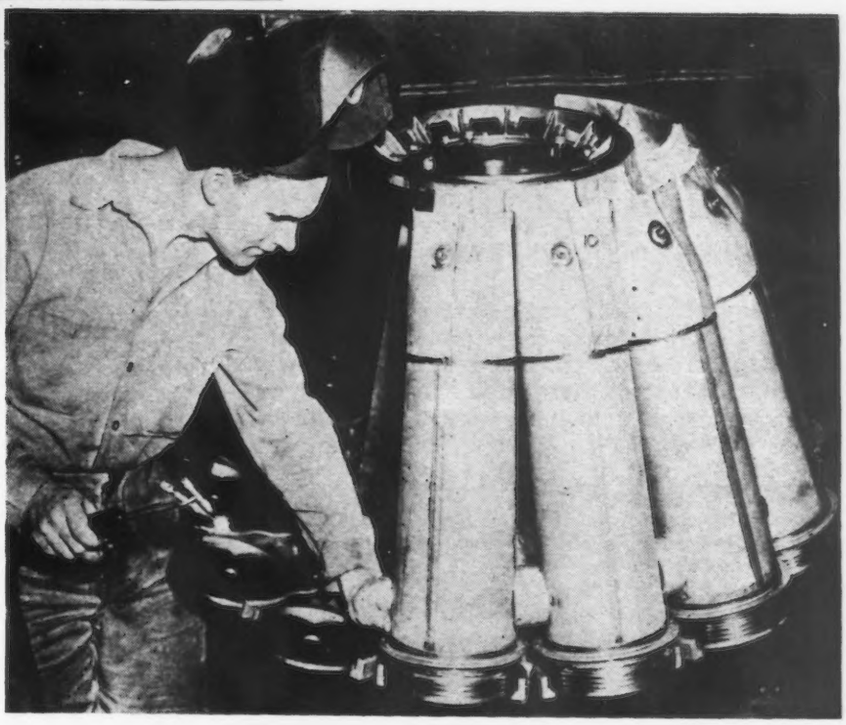
FIG. 2—Placing combustion tubes in fixture tubes.

o o o

BOTTOM

FIG. 3—Ring and tubes for the gas turbine assembled with hydrogen backing fixtures in places.

▲ *Photos taken at ITE Circuit Breaker Co., Philadelphia, subcontractor fabricator.*

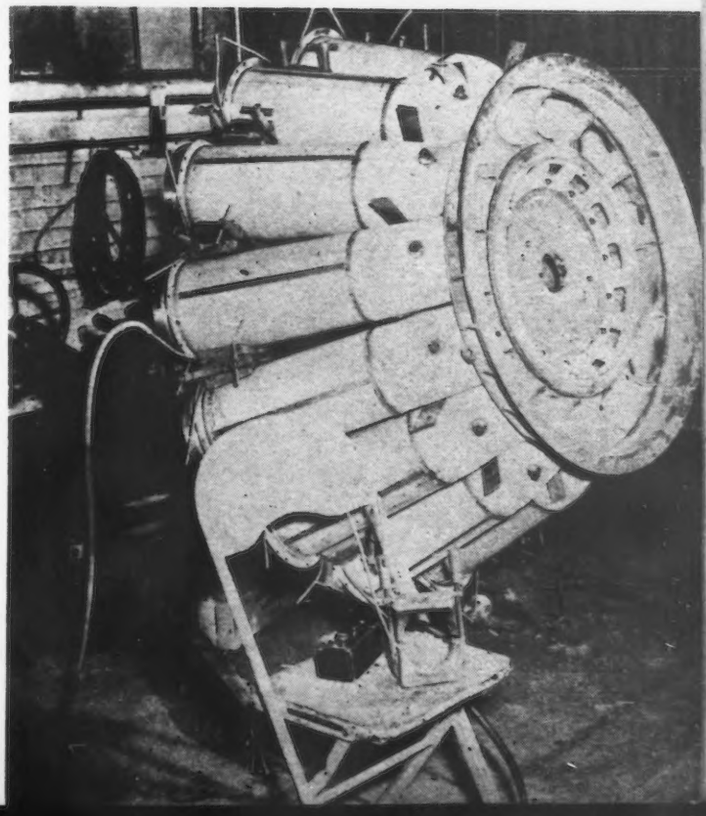


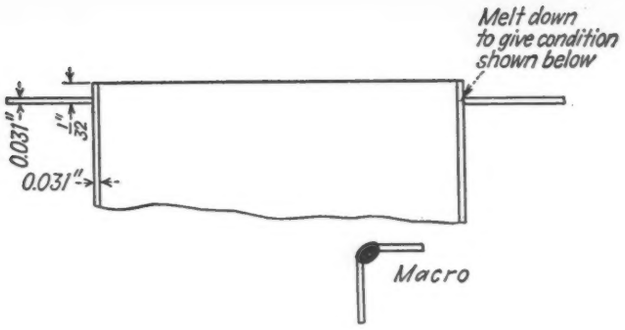
are merly spacers and are removed to permit expansion during welding. In addition, the circle of the tube ends is set out a predetermined amount, so that, when removed from the fixture, the circle will be the correct diameter. Fig. 3 shows the assembly completely welded. When removed from the fixture the free ends of the tube draw in and the height of the assembly is increased. The part is set up in a boring mill and the rings are machined to give the correct height. These dimensions are maintained at ±0.010 in.

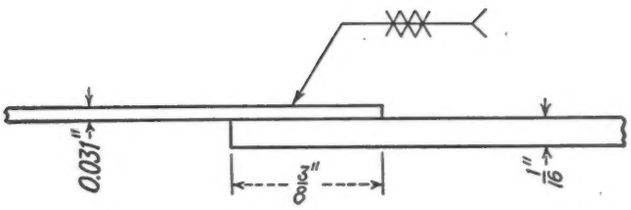
In making the combustion unit, shown in fig. 3, the exhaust unit and the nozzle diaphragm, it is possible, by planned operational sequence, to obtain parts which meet the rigid design requirements. The nozzle diaphragm shown at the head of this article is a complicated assembly having a considerable amount of welding. The areas between the blades and the diameters of the spacer bands are very critical dimensions.

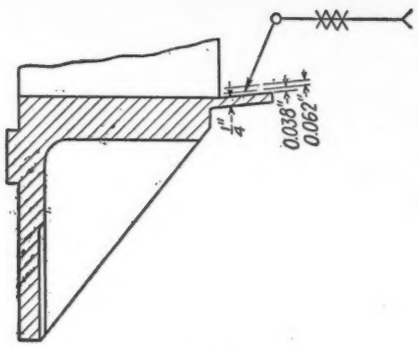
When welding stainless alloys it is necessary to remove all grease, oil and dirt. In most cases the oxide can be floated out of the weld melt so that pickling is not necessary. Tests indicate that in resistance welding the mill finish might even be better than a pickled or grit-blasted surface.

Fig. 4 shows the method of welding the cross-over, or interconnecting tubes, illustrated in fig. 3. This type of joint proved simple to make and provides a smooth passage for gas flow. Preparation and weld data on this piece are as follows: Surface, mill finish; welded by atomic hydrogen arc process; current 14 to 15 amp; no filler material; hydrogen backing; must meet 100 lb hydrostatic test. Fig. 5 is a sketch show-









ABOVE

FIG. 6—Sketch of large flange on the exhaust unit, joined by resistance seam welding.

o o o

UPPER LEFT

FIG. 4—Dimensions of the cross-over tubes shown in fig. 3. These tubes are type 347 metal and are welded by the atomic hydrogen arc method.

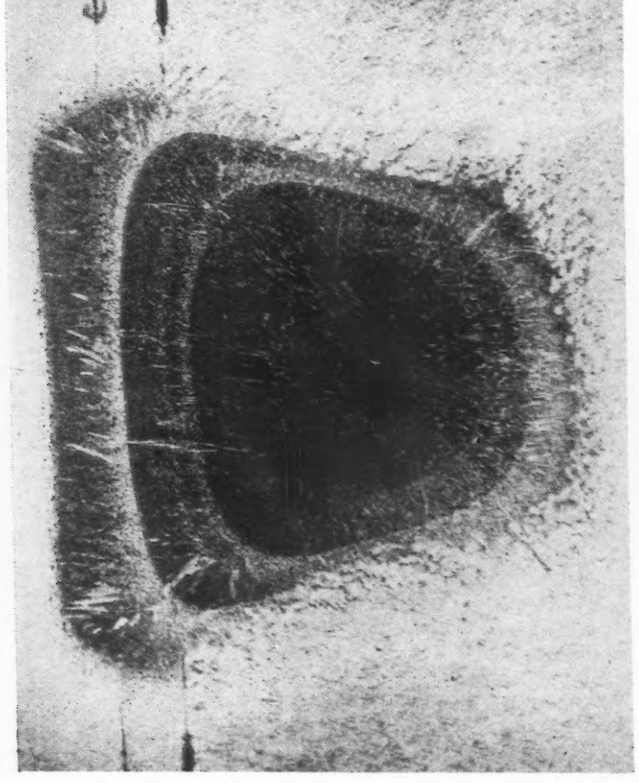
o o o

LEFT

FIG. 5—Sketch of a combustion unit joint. The material is type 347 stainless, resistance welded.

ing the method of producing the resistance seam weld in one of the joints in the combustion unit. Preparation and weld data covering the joint (of type 347 stainless) are as follows: Surface, mill finish; resistance seam welded; welding wheels, 8-in. diam, ¼ in. face, 30° bevel, RWMA class II; current 9000 amp; pressure 800 lb; time, 10 on and 6 off; speed 20 ipm; must meet 100 lb hydrostatic test. In order to prevent the surfaces of this joint from burning a steady stream of water is played inside and outside the surface. Improper cooling here would result in a rough surface condition, and possibly cracks.

FIG. 7—Use of three pieces of metal to obtain penetration into the center piece, which is the thin part of the flange shown in fig. 6.



The part shown in fig. 6 is the large flange in the exhaust unit in type 347 metal. Preparation and weld data on this operation are as follows: Surface, mill finish; resistance seam welded; welding wheels, top, 8-in. diam, 2-in. radius, ½ in. wide, RWMA class II, bottom wheel, 8-in. diam, 1½-in. radius, ½ in. wide, RWMA class II; current, 11,500 amp; pressure, 500 lb; time, 8 on and 3 off; speed, 22 ipm. Two problems are presented here, one to obtain the penetration required into the thin part, and the other to prevent the formation of a fishscale-like surface on the cast ring. Fig. 7 shows the use of three pieces to get penetration into the middle one. This 0.062-in. piece is a strip about ½ in. wide and fits on the inside of the casing.

The surface condition on the cast ring is maintained by proper speed, current and water cooling. The data presented consist of one set of machine settings which provided a satisfactory weld on this part. The inner liner or diffuser, fig. 8, is made of Inconel. Weld data on the diffuser are as follows: Surface preparation, mill finish; resistance welded; welding wheels, top, 8-in. diam, 3/16-in. face, 30° bevel, RWMA class II, bottom wheel, 3-in. diam, ¼-in. face, 40° bevel, RWMA class II; current, 7500 amp; pressure 800 lb; time, 10 on and 6 off; speed, 24 ipm. This part is in direct contact with the flames, so that the better heat resistance of Inconel is desirable here.

In making welds by the atomic hydrogen arc welding process, hydrogen gas was used to back to joints. This resulted in clean, sound welds with good corrosion resistance. The decision to use this procedure was reached after considerable experimentation with other gases and fluxes.

The use of city gas gave very inconsistent results. Carbon was often picked up in such quantities as to

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FIG. 8—Turbine inner liner or diffuser. Sketch shows Inconel joint on the diffuser jointed by resistance welding.

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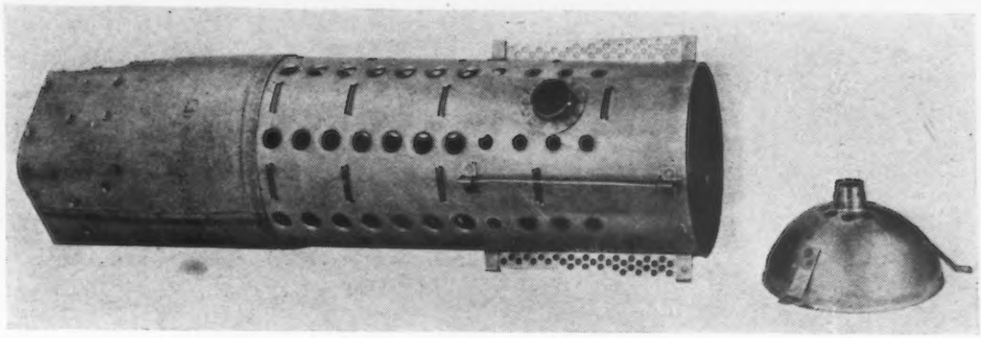
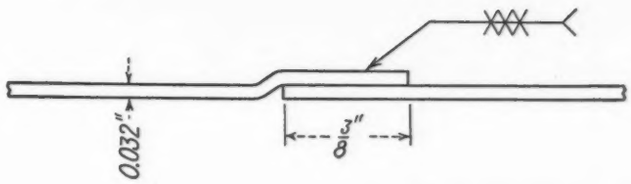




overcome the advantage gained by using a columbium-stabilized alloy. Nitrogen, unless very pure, did not afford sufficient protection against oxidation. Hydrogen, on the other hand, gave excellent and consistent results.

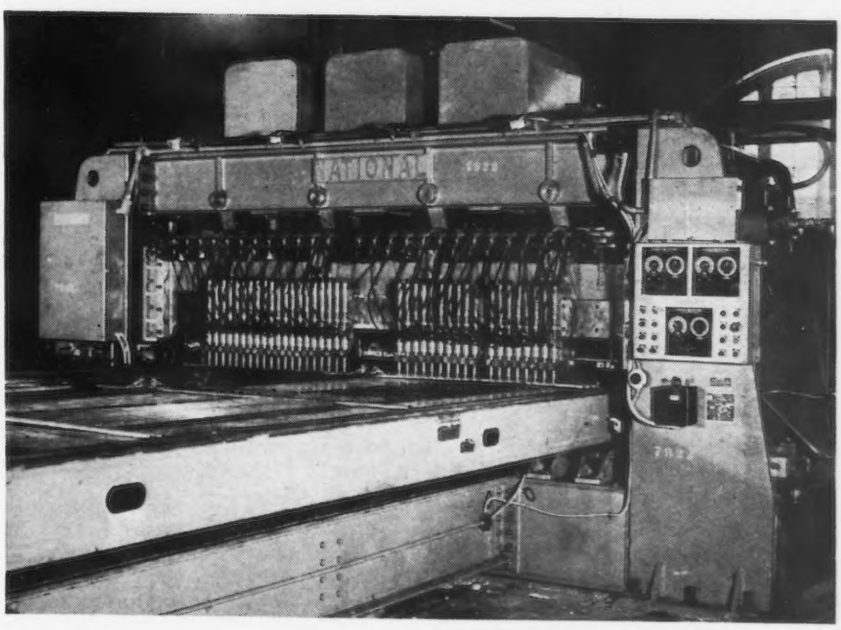
Many fluxes were also tried. The back side of the joint was painted with flux and the weld was made by the atomic hydrogen arc. Appearance of these welds seemed satisfactory, but when repair welded or heated in operation, cracks originated at the root and often came through to the face of the weld. An examination of these welds revealed the formation of a low melting alloy which actually wets the surface in the same way as a brazing alloy.

This low melting alloy is brittle and often forms throughout the weld. It is also subject to attack by corrosion, and is very weak at high temperatures. In some cases, the appearance of the root indicated complete penetration, but macro and micro examinations show that only the surface of the joint is welded and the rest was brazed. One or two of the fluxes tested did not induce the formation of this low melting alloy to any great extent. However, since cleaning is required after welding when flux is used, and since hydrogen is cheap and clean, it was decided to standardize on its use when atomic arc welding stainless alloys for high temperature use. Of the many fluxes used for chromium, Amco No. 433 appeared to give the best results on stainless or Inconel flux for Inconel metal.

Multiple Spot Welder For Railroad Cars

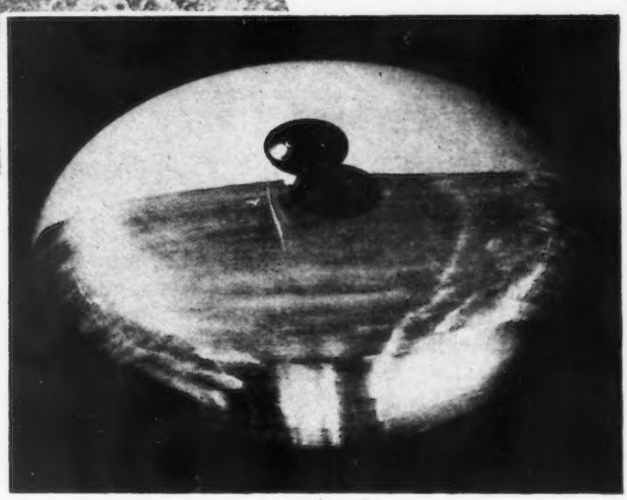
ONE of the largest multiple spot welding machines in existence has recently been put in operation by the Pullman-Standard Car Manufacturing Co., at their Chicago plant. Welding engineers say it will increase production about 30 times over present processing. The machine weighs 90,000 lb and was built by the National Electric Welding Machine Co., Bay City, Mich.

Primary operation of the machine is to weld stiffeners to the interior of car sides which lends strength and smoothness to the construction. An electric eye arrangement makes the operation entirely automatic. Through use of a photoelectric cell control, the circuit is completed which positions the work, lowers the electrodes, makes the weld, lifts the electrode and repositions the work for the next operation. Any number of welds up to 48 can be made at a single stroke.



Surface

SINCE aluminum is non-rusting, this Reynolds all-aluminum boat requires only a light spray of aluminum paint for decorative effect. For use in salt water areas the metal is anodized before painting to guard against the severe corrosive action of salt water.



ON this aluminum part the front portion has been polished with 240-grit abrasive, and the rear portion anodized to show the effect of the process.

ONE of the most important types of finishes produced on aluminum and its alloys is the electrolytic oxide coating. These oxide finishes are obtained by treating the metal anodically in various electrolytes in such a manner as to obtain a thin, inert and durable aluminum oxide on the metal surface. The film formed is very hard and offers excellent abrasion and corrosion protection to the underlying aluminum or aluminum alloy. Some of these films are clear and transparent, while others are colored in varying degrees of brown, gray and silver. They are very high in dielectric strength and possess good absorption qualities for dyes and paints since most are minutely porous.

The first article in this three part series, based on a book by the same author soon to be published by Reynolds Metals, Inc., dealt with chemical surface treatment of aluminum and appeared in the Aug. 29th issue. The concluding article will consider electroplating.

The mechanism of anodic film formation is not complicated. In anodizing, the aluminum is made the anode in an electrolyte capable of yielding oxygen on electrolysis. When current is passed, an initial oxide film forms on the aluminum surface, and progressive oxidation takes place beneath the film thus formed. Hence, the film formed last is next to the metal and the oldest part of the film is on the surface. This part of the film is less dense and softer than at the metal interface, since it has been subjected to the most severe solvent action which tends to dissolve some of the oxide film formed. The aluminum oxide film produced is minutely porous, and thus, current is able to pass through the electrolyte in the pores to the metal without too much resistance to build up fairly heavy oxide films. The borates behave differently and these are taken up later.

CHROMIC ACID—The chromic acid method of anodizing should be preceded by cleaning the aluminum in a hot, mild alkali solution, followed by a rinse in clear, cold water. The work is then made the anode in a 5 to 10 pct solution of chromic acid, maintained at a temperature of about 95°F. A low voltage direct current is applied initially, and then it is increased as rapidly as possible to 40 v. The current density varies from 1 to 5 amp per sq ft. This procedure usually requires about 5 min to reach 40 v, after which the work is treated at this potential for 30 min. The parts are then removed from the tank and rinsed in hot water to facilitate drying. This method produces a gray or greenish-gray aluminum oxide film that is inert, corrosion resistant and absorptive. This film may be subsequently colored by dipping in dye baths. The average thickness of chromic acid oxide films is about 0.00005 in., but the thickness is almost entirely dependent on the current density and time of treatment.

SULFURIC ACID—The sulfuric acid method of anodizing aluminum and its alloys is known in this country as the Alumilite process which is patented by the Aluminum Co. of America, and as the Eloxal GS process in the foreign field. These processes usually employ direct current, but alternating current may be used if desired.

The work is first cleaned, generally in a hot, mild, alkali solution, then rinsed thoroughly in clear, cold water. After this, the parts are made the anode in a 10 to 15 pct solution of sulfuric acid maintained at about 70°F. The time of treatment varies, but it is usually 30 min at 15 to 20 v dc. The current density is about 14 amp per sq ft. After anodizing, the parts

Finishes for Aluminum

By J. F. MASON
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Formation of electrolytic oxide coatings for protection against corrosion and abrasion is described in this article. The use of various acids as well as several patented processes is discussed in detail and information is also given on electropolishing, coloring and sealing anodic films.

are rinsed in water, and the oxide film formed may then be dyed.

The acid concentration of the anodizing bath may be varied from 5 to 70 pct, depending on the composition of the alloy being treated and the nature of the oxide film desired. In general, the oxide films obtained in a sulfuric acid electrolyte are very corrosion and abrasion resistant, possess good absorption qualities, are inert and are heat resistant. Sulfuric acid oxide films vary in thickness from 0.0001 to 0.0004 in.

The use of the sulfuric acid process or the use of any oxidizing acid, except chromic, is not recommended in cases where there is high probability of acid being retained by capillary action or in a closed space, since the acid will cause subsequent deterioration of the aluminum by contact.

OXALIC ACID—Treatment of aluminum in an oxalic acid electrolyte produces films which are moderately hard and abrasion resistant and also possess good corrosion resistance. About 0.0001 in. is an average thickness for the film.

The method generally used for producing this type of oxide film is as follows: First, the parts are cleaned, rinsed and then immersed in a 5 to 10 pct solution of oxalic acid maintained at a temperature of about 85°F. The voltage, which varies from 50 to 65 dc, is applied slowly and the immersion time ranges from 10 to 30 min at the specified voltage. The current density is about 13 amp per sq ft. In the foreign field, this process is named Eloxal. Direct current is used in the Eloxal GX and GXh processes, but alternating current may be used, as in the Eloxal WX process. After the oxide film is formed, the work is rinsed in clear, cold water, after which it may be dyed.

This method offers versatility in that minor changes in the anodizing conditions cause considerable changes in the oxide films produced. That is, the voltage, temperature of the bath, the nature of the current and concentration of electrolyte may be changed to produce various colored films of varying thicknesses.

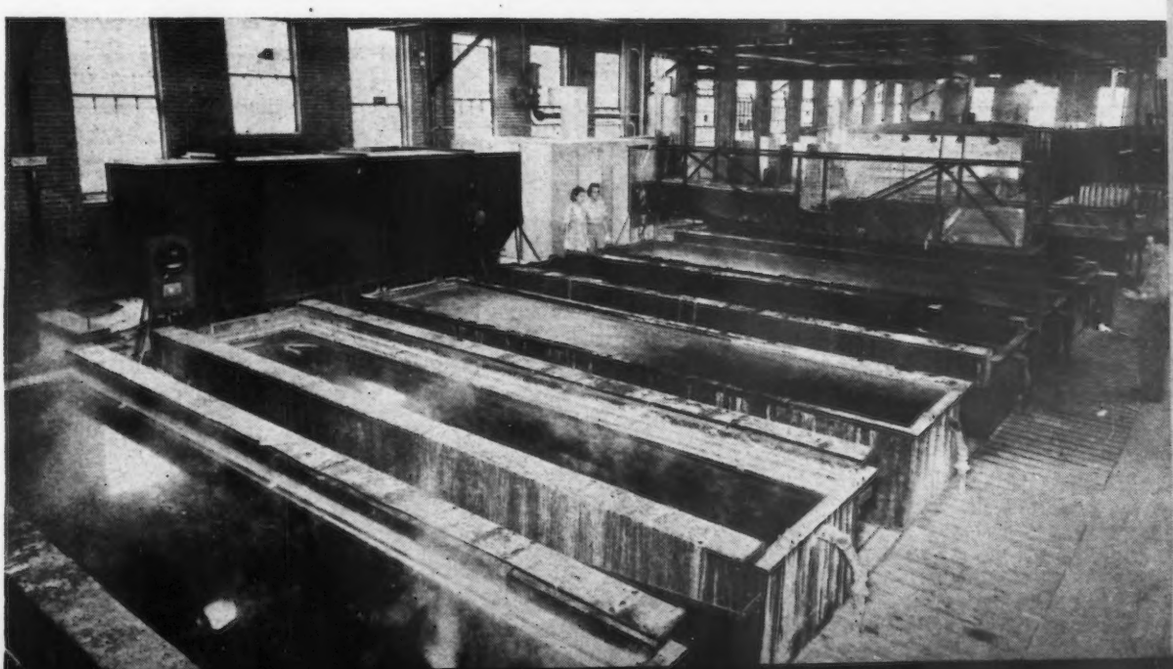
SULFAMIC ACID—Anodic films, comparable to those formed in oxalic and sulfuric acid electrolytes, may be obtained on aluminum and its alloys by means of treatment in a sulfamic acid bath. This process has been developed by the Reynolds Metals Co. The clear, porous films obtained on aluminum are abrasion and corrosion resistant, have good electrical resistance, good heat radiating power and good dye absorption properties.

This anodizing method employs a bath operating temperature of about 120°F. The 15-min period of treatment required is much less than for other electrolytes. The parts are cleaned, rinsed and then immersed in a 5 to 10 pct solution of sulfamic acid. Direct current, at a potential of 15 to 25 v, is needed to give a current density of 6 to 25 amp per sq ft. After the film is formed, the work is rinsed in clear, cold water. The film may then be dyed.

This method has been used to anodize aluminum foil and sheet continuously. The initial current surge is not great and, therefore, there is little danger of burning or pitting the work as it enters the bath.

PHOSPHORIC ACID—Aluminum and its alloys may be anodized in phosphoric acid solutions to produce hard and durable oxide films, which provide a desirable base for electroplating.

The procedure used is about the same as anodizing in other solutions. The parts are cleaned, rinsed first



ANODIZING is one of the most popular and most important processes used to protect aluminum from corrosion. These anodizing tanks at the Reynolds Metals plant will handle the largest size pieces.

in cold and then in hot water. After this, the parts are dipped in a hot, caustic soda solution (5 g per liter) for about 30 sec, then rinsed in cold water. Anodizing is done in a 55 to 60 pct solution of phosphoric acid maintained at a temperature of 85° to 90°F. The anodizing time varies from 5 to 15 min and the voltage varies from 5 to 30 v dc. After the film is formed, the work is rinsed in clear, cold water.

If aluminum alloys high in copper or silicon are to be treated, the concentration of the phosphoric acid solution is reduced to about 20 to 25 pct and the temperature of the bath is increased to about 95°F.

BORIC ACID—Hard, impervious and non-absorptive oxide coatings are obtained on aluminum and its alloys by treatment in a boric acid electrolyte. The procedure used is comparable to anodizing in other acids. The metal is first cleaned in a hot, mild, alkaline solution, and then rinsed in cold water. The work is then immersed in a 9 pct boric acid solution to which 0.2 pct of borax has been added. The bath is maintained at about 200°F, and a potential of about 230 to 250 v dc is applied. After anodizing, the parts need only be rinsed in cold water. Thin oxide films alone can be produced by this method because the production of an impermeable film of high electrical resistivity causes a large voltage drop. This automatically reduces the rate of formation of a film with increasing thickness. These films are used particularly for their high electrical insulating characteristics.

Electropolishing

The reflectivity of aluminum, which is normally about 70 pct, can be increased to about 85 pct by electropolishing. This may be accomplished either by means of the sulfuric-phosphoric acid bath, patented by Battelle Memorial Institute; or by the Alzak process, patented by the Aluminum Co. of America; or by the Brytal process, patented by the British Aluminum Co. These treatments act as electrolytic buffers, since they tend to remove impurities from the aluminum surface and level off minute elevations. They also produce a very thin oxide film on the aluminum surface, but this film is usually reinforced by subsequent anodizing in sulfuric, oxalic or sulfamic acids to obtain a clear, hard, temperature and exposure resistant coating.

In these processes, used extensively for aluminum lighting reflectors, the work is made the anode and metal is removed selectively. The process depends on the phenomenon of anodic polarization, which occurs only under limited conditions. The solution and treatment used render the depressions anodically passive and the elevations anodically active. Thus, the rate of dissolution of elevations is greater than that of depressions. The grains of the metal are not distorted, as is done if mechanical buffing is employed, but a highly polished surface is obtained. This treatment produces a surface which has superior corrosion resistant properties.

BATTELLE PROCESS—The process developed by the Battelle Memorial Institute is a practical method for obtaining high reflectivity on suitable aluminum sheet. The procedure consists of first cleaning the work and then rinsing it in cold water. After this, the parts are immersed in a bath consisting of 40 pct sulfuric acid and 60 pct phosphoric acid for about 15 min. Glycerine (0.1 pct) is sometimes added as a buffer. A dc potential of 5 to 15 v, at a current density of about 100 to 150 amp per sq ft, is employed. The temperature of the bath is maintained at about 140°F, but higher temperatures may be required. After removal from the electrolyte, the work is rinsed in cold water. This process forms a very thin, transparent, glossy, oxide coating on the aluminum surface and gives it the high reflection factors desired. About 0.0002 in. of metal may be removed during this treatment.

ALZAK PROCESS—The Alzak process, patented by the Aluminum Co. of America, produces highly reflecting surfaces by an anodic treatment in a 2.5 pct solution of hydrofluoric acid. The bath may be maintained at about 85°F, and the voltage is approximately 15 to 30 v, giving a current density of about 10 to 20 amp per sq ft. The process time is about 5 to 10 min.

This process produces surfaces which reflect about 85 pct of the incident light. The surfaces so produced retain their properties under mild exposure conditions for a long time, provided they are cleaned periodically.

The reflecting surfaces produced by the Battelle and Alzak processes are usually given a final oxidizing treatment to provide surface protection. This anodic film does not diminish the high reflectivity to any great degree. The final oxidation is generally carried out in a 7 pct solution of sulfuric acid at a current density of about 12 amp per sq ft at a potential of about 20 v dc. The exposure time is 10 to 20 min. It is then desirable to seal the oxide film. This may be accomplished by a patented process which consists of immersing the parts in hot water at 180° to 212°F for 10 min.

BRYTAL PROCESS—This method for producing highly reflective surfaces is patented by the British Aluminum Co. The process entails treating the work anodically in an alkaline solution consisting of 15 pct by weight of sodium carbonate and 5 pct by weight of sodium orthophosphate in water. The pH of this solution must be at least 10. The work is first pickled in this bath before any current is passed. The bath is maintained at a temperature of 170° to 185°F and direct current of about 10 to 15 v is applied, giving a current density of about 20 to 30 amp per sq ft. The time of treatment is about 10 to 15 min. The parts, after removal from this bath, are thoroughly rinsed and then anodized in a solution of sodium bisulfate (5 to 40 pct by weight) to give them a clear, transparent, protective film. The temperature of this bath is maintained at 70° to 120°F and the current density is 5 amp per sq ft for 10 to 15 min. The reflectivity of aluminum surfaces obtained by this process is about 85 pct.

Aluminum reflecting surfaces produced by these three methods possess good corrosion and abrasion resistance. Thus, the surfaces are protected against tarnishing by chemicals, are resistant to fingermarking, and withstand outdoor service conditions. Cleaning with mild soap and water may be necessary at intervals to remove any accumulation of grime, and to restore the reflectivity of the surface. These aluminum reflectors will withstand temperatures up to about 400°F without crazing the surface.

COLORED ANODIC COATINGS—The oxide films produced on the surface of aluminum and its alloys may be colored by several methods. These processes involve (1) the absorption of organic dyes into porous anodic films, (2) the treatment of the oxide film with inorganic materials, and (3) the production of colored

films directly from the electrolyte by acid combinations and addition agents in the bath.

The first process involves the immersion of the work on which a porous oxide film has been obtained, in a 0.1 pct organic dye bath maintained at about 170°F. The time of immersion is about 10 min. Anthracene blue and alizarin red S are typical of a large number of acid dyes which may be employed to obtain various colors. Basic organic dyes may be used provided the oxide film is first etched in 5 pct potassium dichromate, sodium borate or oxalic acid. Examples of suitable basic dyes are victoria blue B or green, auramine or rhodamine B. The basic dye solutions must be highly concentrated.

The second process involves treating the porous oxide film successively with solutions which react with one another on the oxide film forming insoluble colored compounds. It is advantageous to use concentrated solutions, but the temperature is not important. A few of these solutions are: (1) nickel acetate treated with ammonium sulfide will produce black films; (2) zinc acetate treated with potassium dichromate will produce yellow films; (3) potassium ferrocyanide treated with ferric chloride will produce blue films. Colors may also be produced by immersing the oxide films in a 20 pct solution of lead nitrate or cobalt nitrate. This produces a brown color which is afterwards treated by immersion in a 5 to 10 pct solution of potassium permanganate at 160°F.

Colored oxide films may be produced directly in the anodizing bath by acid combinations and addition agents. For example, chromic and oxalic acids produce varying shades of brown; sulfamic acid and sodium borate produce silvery oxide films. The time, temperature, current density, voltage, electrolyte used, as well as the aluminum alloy treated, have a direct bearing on the color obtained.

SEALING OXIDE FILMS—The porous oxide film produced in oxalic, sulfuric, chromic or sulfamic acid may be sealed by immersion in hot water at 180° to 212°F for 10 min. This patented treatment converts the aluminum oxide to the monohydrate with a consequent increase in volume which effectively seals the pores of the film.

The pores of oxide films may be sealed by immersion in a 5 pct solution of sodium chromate or potassium dichromate. A sodium silicate solution (5 pct) may also be used for this purpose. Solutions of nickel or cobalt acetate (1 to 2 pct) are used to seal porous films especially after they have been treated with organic dyes. These materials have a tendency to set the dye and to seal the pores of the oxide film at the same time. These are patented processes.

New Books

"Foundry Process Control Procedures," a compilation of six reports prepared by SAE committees for Army Ordnance Dept. on process control in ferrous foundries and the repair of ferrous castings. The publication covers recommended procedures for process control of gray iron, steel and malleable castings and repair operations. Purpose of recommendations is to eliminate cause of scrap and defective materials and was developed to aid new foundries in war production. SAE, 29 West 39 St., New York 18. 145 p, $1.50 to SAE members; $3 to nonmembers.

* * *

"How to Supervise People," by A. M. Cooper. A practical manual discussing principles of industrial supervision, especially from the postwar viewpoint. Written especially for foremen, office supervisors and executives. McGraw-Hill Co., Inc., 330 West 42 St., New York 18. 162 p. $2.

* * *

"Standard Code for Arc and Gas Welding in Building Construction," a new 1946 edition of the standard code to replace the 1941 (tentative) edition. Embodies revisions based on experience in recent applications of welding to structural fabrication and on further research investigation. American Welding Society, 33 West 39 St., New York 18. 68 p. 50¢.

* * *

"Involutometry and Trigonometry," by Dr. Werner F. Vogel. Gives numerical tables intended to simplify engineering calculations related to the design of involute curves and surfaces. An unusual system of involute tracing tables may revolutionize the prevailing layout methods of involutes at large scale Intended for the use of the gear engineer. Michigan Tool Co., 7200 E. McNicholas Rd., Detroit 12. 321 p. $20.

* * *

"Welding Aluminum," a comprehensive review of the latest practices and recommendations for joining aluminum and its alloys by gas, arc, and resistance welding. Chapters on brazing and soldering are included, as well as general information as to the weldability of the more widely used alloys. Reynolds Metals Co., 2500 South Third St., Louisville 1. 88 p. $1.

* * *

"Aluminum Alloy Selector," a slide-rule type of chart, 8½ x 11 in. in size, from which it is possible to obtain a mass of technical information concerning 18 of the most widely used aluminum alloys. Alloys covered include, 2S, 3S, 14S, 17S, 18S, 24S, Pureclad 24S, 25S, 32S, A51S, 52S, R353, 56S, R361, R301, R303, Clad R303, R317. By setting one slide for the alloy and the other slide for the product, the user has available in handy form data on mechanical properties, chemical composition, physical constants, thermal treatments and specifications. Reynolds Metals Co., Dept. 47, 2500 South Third St., Louisville 1. $1.

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"Lincoln's Incentive System," by J. F. Lincoln. Gives complete details of how Lincoln Electric Co. has applied incentives over a long enough period of years to prove it successful, and sets forth the principles and results achieved. Treats incentive management philosophy not only as a method of wage payment, but as an economic system. McGraw-Hill Book Co., Inc., 330 West 42 St., New York 18. 102 p. $2.

Selecting Nonferrous Bearing Material

Structure, physical properties and proper application of nonferrous bearing alloys are discussed in this article. The babbitts, the copper-lead group and the single phase metals as pure lead, tin, etc., are covered. The more recently developed aluminum-base bearing alloys will be described in an article to be published next week.

o o o

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o o o

IT is generally recognized that the function of a bearing is to prevent, or minimize, damage due to failure of lubrication. Under normal or ideal conditions the bearing has little, if any, influence on the operation of the machine, and its virtues become apparent only when lubrication is suspended. Knowledge of conditions which follow the suspension or failure of the oil film is essential to the intelligent selection of the bearing alloy.

According to the fluid film theory of bearing action, the material of the shaft and the bearing is unimportant if the bearing is well lubricated and remains so during operation in service, since there is no metal to metal contact. Under normal operating conditions at constant speed and load, the shaft or journal should be continually floating on a film of oil. With proper clearance between bearing and journal, the shaft lifts off the bearing as it begins to rotate and assumes a position in the bearing where the shaft and bearing are not concentric. Oil film pressures are maximum at the point of closest approach of journal to the bearing. Fig. 1 shows a diagram of the position assumed by a rotary shaft in a bearing. However, in actual service the fluid film is often broken, and conditions of starting, stopping and accelerating will cause departure from the ideal conditions.

The probability[1] of maintaining a condition of full fluid lubrication in a dynamically loaded bearing subject to misalignment, shaft deflections and occasional overloads depends on the mechanical properties of the bearing material. A lack of adequate conformability or elastic deformation will accentuate lubrication film breakdown and metallic contact. Highly stressed bearings, even when the mechanical properties are favorable, undoubtedly operate in part, and possibly at times totally, under conditions of boundary friction. It is in this circumstance that the chemical composition of the bearing material comes into full play to govern whether the bearing will fail or continue in operation through the emergency period.

It has been established that the microstructure or mechanical structure of the bearing material has even greater influence on its ability to meet bearing requirements than has its composition. The mechanics of the progress of fatigue failure in engine bearings indicates that the structure of the bearing alloy is of most vital importance.

It has been stated that in a bearing assembly of given dimensions and with adequate stiffness, the coefficient of friction is not affected by the materials of the bearing or the shaft, nor by the composition or oiliness of the lubricant, as long as there is an ample supply of lubricant; and that it is affected by the pressure on the bearing, the speed of the shaft and the viscosity of the lubricant at the operating temperature in such a manner as to decrease with the pressure, increase with the speed and increase with the viscosity.

Among the properties a good bearing alloy should have, the following are important:

(1) Adequate yield strength in compression, especially at operating temperature, to prevent measurable permanent deformation or a brinelling of the bearing material under load.

(2) Sufficiently high softening point to withstand any service temperature.

(3) Sufficient but not excessive hardness to permit embedding of grit and dirt particles contaminating the lubricating fluid.

(4) Plasticity or ability to deform under load to take care of alignment and to conform to the shaft.

(5) Sufficient ductility and absence of brittleness to withstand pounding and torque without flaking or cracking.

(6) Low modulus of elasticity to permit elastic deflection.

(7) Low coefficient of friction to prevent galling, abrading and seizing.

(8) Ability to maintain an oil film on its surface or to absorb certain compounds of the lubricant.

(9) High thermal conductivity to remove and dissipate frictional heat from the surface.

(10) Good wear resistance.

(11) Good corrosion resistance to the action of the lubricant or products which may be developed in the oil by use.

In bearing service there are three kinds of wear to be encountered: (1) Abrasion due to foreign particles in the oil film; (2) mechanical wear due to metal to metal contact between the bearing surfaces, and (3) corrosion of the bearing surfaces due to oxidation or chemical reaction by active compounds in the lubricant.

Formerly, nonferrous bearing alloys were divided

[1] *Hunsicker and Kempf, "Aluminum Alloys for Bearings," SAE, June 1946.*

into two groups; the white metals or babbits which were composed of varying proportions of tin, lead, antimony and copper; and the bronzes which contained varying proportions of copper, tin, lead and phosphorus. It has been claimed that the characteristic requirements of good bearing metal demands that it be sufficiently soft and plastic to accommodate itself to the inequalities of the moving parts and thus afford them an even bearing, and that it should also present a surface of sufficient hardness to prevent abrasion and wear. On this basis it was stated that these two requirements, hardness and plasticity, could be obtained only by having a body consisting of small, hard particles embedded in a plastic matrix. This result was most easily produced by alloying a soft metal, such as lead or tin, with one or more metals which formed definite intermetallic chemical compounds capable of crystallizing out in the cooling mass. Much depended, however, on the size and number of these hard particles. The hard particles were to carry the load and resist wear, while the softer matrix allowed the metal to adjust itself to the surface of the shaft and equalize bearing pressure. The softer ground mass also carried the lubricating film and maintained oiliness.

Steel-backed copper lead lined bearings.

Photo courtesy Cleveland Graphite Bronze Co.

This belief that a bearing metal must have hard particles in a soft matrix, as in ordinary babbitts, or soft particles in a hard matrix, as in the copper-lead alloys, has been questioned. The efficiency of pure metals as tin, lead, silver and cadmium as bearing materials has proved that single phase materials can also be satisfactory.

It is now recognized that there are three different types of nonferrous bearing metals, varying in their physical structure: (1) Soft plastic matrix containing hard, wear resistant particles, such as the babbitts in which the matrix may be a pure metal, a solid solution, a binary eutectic or a ternary eutectic; (2) strong, tough, wear resistant matrix containing softer plastic particles, such as the copper-lead alloys, in which the insoluble lead particles are uniformly distributed throughout the copper matrix, and (3) single phase, homogeneous material, such as the pure metals lead, tin, bismuth, cadmium and silver, or slightly alloyed pure metals but still maintaining a single phase.

The first group of bearings consists of the lead-base babbitts, the tin-base babbitts, the cadmium-base babbitts and the zinc-base babbitts. These are of relatively soft material, have excellent antiseize characteristics and can be used at high sliding speeds. To improve load carrying capacity they must be supported by a bearing shell made of a stronger material such as steel, or, in some cases, bronze.

Typical properties of the lead-base alloys (lead-antimony-tin (are given in table I, while table II covers the typical properties of the tin base alloys (tin-antimony-copper). Information on the exact chemical composition and properties of each of the accepted bearing alloys may be found in detail in ASTM standards.

The lead-base group of bearing alloys may be subdivided further into the lead-antimony series, the lead-antimony-tin series and the lead-calcium series of alloys, each series having its own bearing characteristics and field of application. The lead-antimony alloys contain up to a maximum of 18 pct Sb which acts as a hardener for the lead. An antimony content of more than 18 pct makes the alloy brittle and of little use. For alloys under 12 pct Sb the microstructure shows primary grains of the solid solution of antimony in lead (about 99.75 pct Pb, 0.25 pct Sb) surrounded by the eutectic of the lead-rich solid solution and the antimony-rich solid solution. Since the solubility of antimony in lead and of lead in antimony at room temperature is so slight the microstructure for practical purposes may be considered as primary grains of lead surrounded by a eutectic of lead and antimony, depending on the method of casting and the rate of cooling. For alloys over 12 pct Sb the microstructure is that of a few primary grains of antimony surrounded by a large amount of the lead-antimony eutectic. The addition of 1 to 3 pct As helps in retaining strength at elevated temperatures. In general the lead-antimony alloys are soft and weak, and are used for light loads and low speeds.

The lead-antimony-tin series of alloys is stronger and suitable for moderate to high speeds, moderate loads, and can be used at higher operating temperatures. The constituents present are antimony crystals or SbSn crystals, or both, in a eutectic matrix consisting of 4 pct Sn, 12 Sb, 84 pct Pb. The antimony and the Sb-Sn crystals are both cuboids. Both are hard and brittle and form the load carrying medium. The number and size of the particles or crystals are influ-

TABLE I

Typical Properties of Lead-Base Alloys

(Lead-Antimony-Tin)

Tensile strength	at 70°F	65,000 to 10,000 psi
	at 212°F	5,000 to 8,200 psi
Yield strength	at 70°F	2,800 to 3,800 psi
	at 212°F	1,250 to 2,100 psi
Pct elongation	at 70°F	0.5 to 15
Brinell hardness	at 70°F	14 to 26
	at 212°F	6 to 11

enced by the casting conditions, which in turn affects the mechanical properties. Very good frictional properties, reasonably good corrosion resistance and low price have established a wide field of application for the lead-antimony-tin babbitts. Lead-base babbitts range from 90 pct Pb, 10 pct Sb with 14 Brinell hardness to 75 pct Pb, 15 pct Sb, 10 pct Sn with 22.5 Brinell hardness.

The lead-calcium or lead-alkali alloys, containing about 97.5 pct Pb, are the precipitation-hardening type and retain hardness better at elevated temperatures, resist impact better, but have lower corrosion resistance. These alloys have high coefficients of expansion and high rates of wear. Other alkali or alkaline earth metals may be substituted for the calcium. This type is used where loads are light to moderate and speeds are low. The alkali-hardened lead alloys vary considerably in composition and range in hardness from 20 to 35 Brinell.

The tin-base babbitts contain tin, copper and antimony with cadmium and nickel sometimes added to improve their properties. These babbitts range in composition from 92 pct Sn, 4 pct Sb, 4 pct Cu with about 20 Brinell hardness, to 79 pct Sn, 12 pct Sb, 7 pct Cu or 80 pct Sn, 10 pct Sb, 10 pct Cu with about 29 Brinell hardness. For the purpose of reducing costs, they may contain as much as 30 pct Pb. The commercial tin-base bearing alloys may have a structure either of copper-tin needles or of copper-tin needles and antimony-tin cuboids in the soft matrix consisting of tin, copper-tin eutectic. The copper-tin needles and the antimony-tin cuboids are hard and brittle intermetallic chemical compounds and are the immediate cause of the hardness and strength of the alloy. Here again the structure depends on the casting method and the rate of cooling. The alloys showing a structure of only the Cu-Sn needles in the eutectic matrix are softer and have considerably more ductility than those alloys showing a structure having both the Cu-Sn needles and the Sb-Sn cuboids in the eutectic matrix. Additions of cadmium (up to 3 pct) increase the endurance limit, hardness and strength at elevated temperatures, while additions of nickel aid in refining the grain. These bearings are used for moderate to high speeds and loads. They have low frictional resistance, low wear, good running-in properties, good emergency behavior upon failing of lubrication, and lower coefficients of expansion than the lead-base alloys.

TABLE II

Typical Properties of Tin-Base Alloys

(Tin-Antimony-Copper)

Tensile strength	at 70°F	9,500 to 18,000 psi
	at 212°F	6,000 to 10,000 psi
Yield strength	at 70°F	4,400 to 6,600 psi
	at 212°F	2,150 to 3,150 psi
Pct elongation	at 70°F	4.5 to 15
	at 212°F	10 to 20
Brinell hardness	at 70°F	17 to 29
	at 212°F	8 to 16

Tin-base babbitts work against soft shafts with little tendency towards scoring. They allow low clearance, an aid to effective lubrication; are high in embeddability and conformability; have low elastic modulus; bond reasonably well to bronze and steel; are not corroded by most lubricating oils at operating temperatures, and are properly wetted by the lubricant. The only drawback is the low melting point of tin and the rapid falling off of strength as the melting point is approached.

Cadmium-base alloys contain 97 to 99 pct Cd plus nickel and silver or copper. If silver is not present in the alloy its performance is not satisfactory as a bearing material. A cadmium-base alloy containing about 1.35 pct Ni has a tensile strength of 16,400 psi, an elongation of 19 pct, a reduction of area of 43 pct and is less brittle than the tin-base babbitts. This alloy is used for conditions of high stress and high temperature, that is, for higher operating temperature and heavier duty than the tin or the lead-base babbitts. However, they are more subject to corrosion in organic acids in the lubricating oils, which, nevertheless, can be corrected by indium plating the bearings and diffusing the indium into the bearing surfaces by heat. These alloys offer promise due to the known low frictional effect between cadmium and steel, and are used with shafts having a minimum Brinell hardness of 250. They do not score shafts as easily as the leaded bronzes.

An alloy consisting of 85 pct Zn, 10 pct Cu and 5 pct Al has been successfully used as a bearing where loading is steady and no shocks are encountered in service at high speeds. It has a low coefficient of friction, but the metal has a tendency to become brittle under the effects of heat, and requires a great deal of attention. In general, the zinc-base alloys are very hard, approximately 120 Brinell, and very brittle. Zinc and zinc-rich solid solutions are prone to seizure at elevated temperatures, a characteristic which limits their use. They have limited use in service as bushings in applications where bronze bushings have been used.

The tin-base babbitts have been most widely used and in the past have been quite successful. They represent long experience, covering a wide range of compositions and manufacturing practices. Important factors in babbitts for successful service performance are freedom from brittleness, freedom from low melting constituents, and the necessity for high load strength between the bearing metal and the backing. The babbitts are particularly good with regard to low frictional characteristics and freedom from wearing and galling of shafts, but the principal disadvantage of this type is a susceptibility to fatigue failure at elevated operating temperatures.

Copper-Base Alloys

The second general group of bearings is the copper-lead alloys and the copper-tin-lead alloys containing up to 30 pct lead. In general they are used for severe service where babbitts will fail. There are all gradations of these copper alloys from 81 pct Cu, 19 pct Sn with 125 Brinell hardness to 88 pct Cu, 10 pct Sn, 2 pct Zn, and from 85 pct Cu, 5 pct Sn, 5 pct Zn, 5 pct Pb with 55 Brinell hardness to 70 pct Cu, 1 pct Sn, 29 pct Pb with 35 Brinell hardness, while a straight 65 pct Cu, 35 pct Pb alloy has a hardness of approximately 20 Brinell. Silver can be substituted for some

of the copper to increase fatigue strength, but at a sacrifice of antifrictional properties.

The 30 to 35 pct leaded copper alloys have excellent bearing properties. However, the strength is low and the alloys are subject to failure by fatigue cracking. The higher the lead content of these binary alloys the lower is the fatigue strength and the higher the antifrictional characteristics. The addition of tin increases strength and reduces the tendency towards fatigue cracking. The physical characteristics of copper-lead alloys are less affected by temperature; the material will not seize, and overheating does less damage than do the babbitts. To prevent seizing a thin coating of lead is sometimes plated over these bearing materials. The basic reason that copper-lead alloys have replaced babbitts for high speed engines is the latter's lower resistance to fatigue. The copper-lead bearing alloys form a solid solution (copper and iron) with the steel backing and this intermediate layer is more malleable, and adhesion is maintained in spite of the deformations and vibrations encountered in service. Leaded copper and leaded bronzes require the use of hardened steel journals and uninterrupted lubrication. Corrosion is a major problem as these alloys are easily corroded by improper oils.

Two new bearing alloys, containing 8 pct Ni, 1 pct Sb, 1 pct Zn, 10 pct Pb, balance Cu, and 8 pct Ni, 2 pct Sn, 1 pct Sb, 1 pct Zn, 10 pct Pb, balance Cu, were developed as a substitute for the commonly used 80 pct Cu, 10 pct Sn, 10 pct Pb bearing alloy. Tests showed that these new bearing alloys had three to four times the wear resistance.

Single Phase Bearings

The third group of bearing alloys is the single phase metals such as tin, lead, silver, cadmium and bismuth which have useful bearing characteristics in the unalloyed or slightly alloyed condition for certain applications, up to the limits of their load-carrying capacities. Within its ability to withstand deformation, pure lead is an excellent bearing material. A very thin film of pure tin on a supporting steel back also functions excellently as a bearing. Pure lead, tin, silver and bismuth have good to excellent friction characteristics in the order listed.

Silver bearings (99 pct Ag) are strong enough to resist fatigue cracking and have excellent bearing properties at high loads and high speeds. Silver has no tendency to gall on steel and has a comparatively low, dry coefficient of friction against steel. It has high thermal conductivity and low modulus of elasticity offering high ability for elastic accommodations. The use of silver as a bearing material has shown that its capacity and fatigue resistance, when properly prepared and bonded to the bearing backing, is undoubtedly greater than any other known metal. Both the electrodeposited type and the thermally bonded type have produced satisfactory results. Silver has ability to hold strength at high temperature, but also has too high a coefficient of expansion, poor oiliness characteristics and no appreciable embeddability. By plating the silver on the steel backing with lead, then with indium and finally diffusing the indium into the lead by heating to 350°F, the galling resistance is improved a great deal. The indium improves the corrosion resistance of the lead, permits bearing surfaces to retain the oil film more completely, and increases the strength of the bearing surface into which it is impregnated. Pure silver has a melting point of 1730°F, a coefficient of thermal expansion of 0.0000205 in. per degree C, a tensile strength of 15,000 to 20,000 psi, a yield strength of 5000 to 10,000 psi, an elongation of 40 to 50 pct and a Brinell hardness of 26 to 36 as cast.

Engine tests have indicated that tin and lead base babbitts are superior bearing material to the silver-rich alloys for light loads, low operating temperatures, poor shaft finishes, distorting surfaces and lubricants containing a fairly large quantity of abrasive material. Copper-lead alloys have replaced the soft white metal babbitts only when higher loads and operating temperatures are encountered. Copper-lead bearing alloy, if substituted for white metal in the same application and given proper lubrication, relative freedom from dirt particles in the oil supply, and proper operating clearances from start of operation, may withstand 75 pct greater loading when the temperature of the bearing exceeds 150°F. Fatigue of both white metal and copper-lead alloys will occur if the lining is caused to flex any appreciable amount. Bronze and silver are relatively free from such troubles.

Leaded bronzes containing 10 to 20 pct lead operate

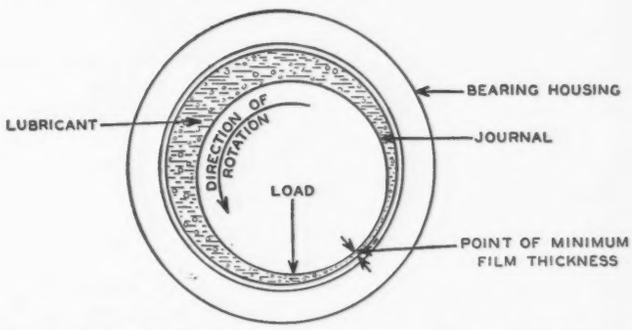


FIG. 1—Sketch illustrates position taken by a rotary shaft in a bearing.

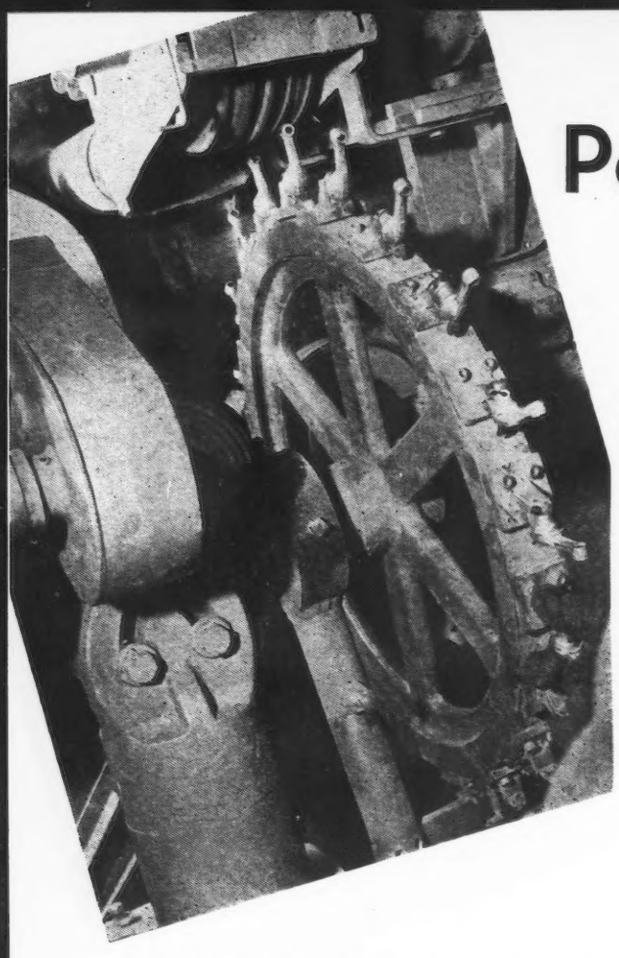
very satisfactorily under extreme high loads and low rubbing velocity, provided journal and bearing alignment are maintained, lubricant is clean and is distributed properly over the rubbing surfaces. Due to their hardness they distort only when a tremendous amount of pressure is brought to bear.

Silver bearings offer possibilities of replacing the bronzes to overcome the weakness of the latter under conditions of high rubbing velocity and uncertain conditions of distortion and lubrication.

Experimental tests[2] have demonstrated a remarkable improvement in the anti-friction and antiseize properties, in the absence of lubrication, produced by extremely thin surface films of relatively soft, low melting metals on a metal of greater hardness and strength. Such observations have led to the hypothesis that the excellent bearing qualities of copper-lead alloys result from a certain degree of extrusion of the lead particles to the surface under the pressure and sliding of the journal with the formation of a thin "lubricating" film of lead over the copper component of the material. Considerable experimental evidence supports such a view.

[2] *Bowden, E., "Lubricating Effect of Thin Metallic Film and Theory of Action of Bearing Metals," Covn. Sci. Ind. Res., (Aust.) Bulletin* 155 (1942).

Properties and applications of aluminum-base bearing alloys, covering both European and American types, will be discussed in the second part of this article.—Ed.



Polishing and Buffing

Resumption of automobile body production by the Fisher Body Div. of General Motors has established a need for large quantities of die cast hardware. This article describes the methods and equipment used at one of the company's Ternstedt plants for polishing and buffing auto hardware preparatory to plating.

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By HERBERT CHASE

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RETURN of Fisher Body plants to the production of automobile bodies has necessitated the manufacture of hardware parts on a large volume basis. As the greater proportion of such parts are die cast in zinc alloy and require plating, one of the Ternstedt plants in Detroit has resumed not only the casting work but the machining, polishing and buffing that precedes plating operations, in addition to plating itself.

In May of this year, this plant produced at the rate of about 500 tons of die castings a month and a high percentage of these required plating. The department covered in this article now confines itself to operations on small parts, such as interior and exterior door handles and window regulators, having abandoned work on large die castings, such as radiator grilles and instrument panels, produced before the war. This simplifies procedures, reduces the number of special machines needed for polishing and buffing and permits concentration upon rapid han-

ABOVE

FIG. 1 — Machine for automatic polishing of die cast regulator handles. Work is advanced between a pair of abrasive belts which run over soft buffs and then passes under the grooved wheel at the top of the unit.

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FIG. 2—Automatic polisher used for removing parting lines from exterior door handles.

Die Cast Auto Hardware • • •

dling of small parts through machines designed especially for this purpose.

Castings, most of which already are trimmed of flash, are received in tote pans delivered from the adjacent foundry on a chain conveyor. Pans are unloaded onto roller conveyors on which delivery to most machines is accomplished. Where line operations, chiefly light machining, are needed, castings are often advanced along chutes from machine to machine. In most cases, however, the arrangement is such that castings are loaded into machines from one tote pan and, after processing, are returned to an unloading station and placed in another box, using separators where needed to prevent scratching. Most machines require only one or two relatively unskilled operators except for setup and adjustment work. As handling is rapid, the labor charge per piece is small.

Castings received untrimmed are passed through trim dies. In general, only one or two machining operations, such as drilling, tapping, spot facing or slot milling, are needed and these are done by conventional machines arranged for rapid work. It then remains only to remove parting lines and burrs, chiefly by polishing, and to buff the exposed surfaces that are to be plated. Although some polishing and buffing are done on wheels with the work held by hand, by far the larger part is accomplished on line or rotary machines that the operators need merely load and unload.

Rapid polishing of regulator handles is done on a special Ternstedt machine, fig. 1, having a series of fixtures around a wheel turning in a vertical plane. Each fixture is loaded at the front by a single operator after which the work is carried between a pair of abrasive belts where they run over buffs of belt width. Since the buffs are soft, the belts yield and conform to the irregular contour of the casting while most of the parting line is polished off. Parts then continue past a grooved wheel at the top of the machines where the end not touched by the belts is polished. Finally, the polished castings reach the unloading position where the casting is removed automatically, the fixture wheel moving continuously.

In general, polishing is confined to the area at or very close to the parting, as other surfaces are cast smooth enough for buffing without polishing. This not only saves labor and machines but avoids cutting through the skin on major exposed surfaces, which is likely to uncover fine subsurface pores that cannot be polished out and are not covered by subsequent plating.

Another and newer form of belt polisher, adapted for use on exterior door handles, is shown in fig. 2. This machine has a circular table around which is a ring of fixtures that carry the work successively under each of eight abrasive belts driven by heads supported on the central table. Each belt is set to polish one portion of the parting line and, when the handle, after loading by one operator, reaches the station where a second operator does unloading, polishing is completed. Such a setup insures uniformity in polishing and is not dependent, as in wheel polishing, upon operating skill, upon somewhat uncertain manipulation of the work or upon the varying pressure that may be applied when the work is held and guided by hand.

Many small parts, especially those in which the

FIG. 3—Loading end of a straight-line buffing machine in which the work passes under nine buffing wheels.

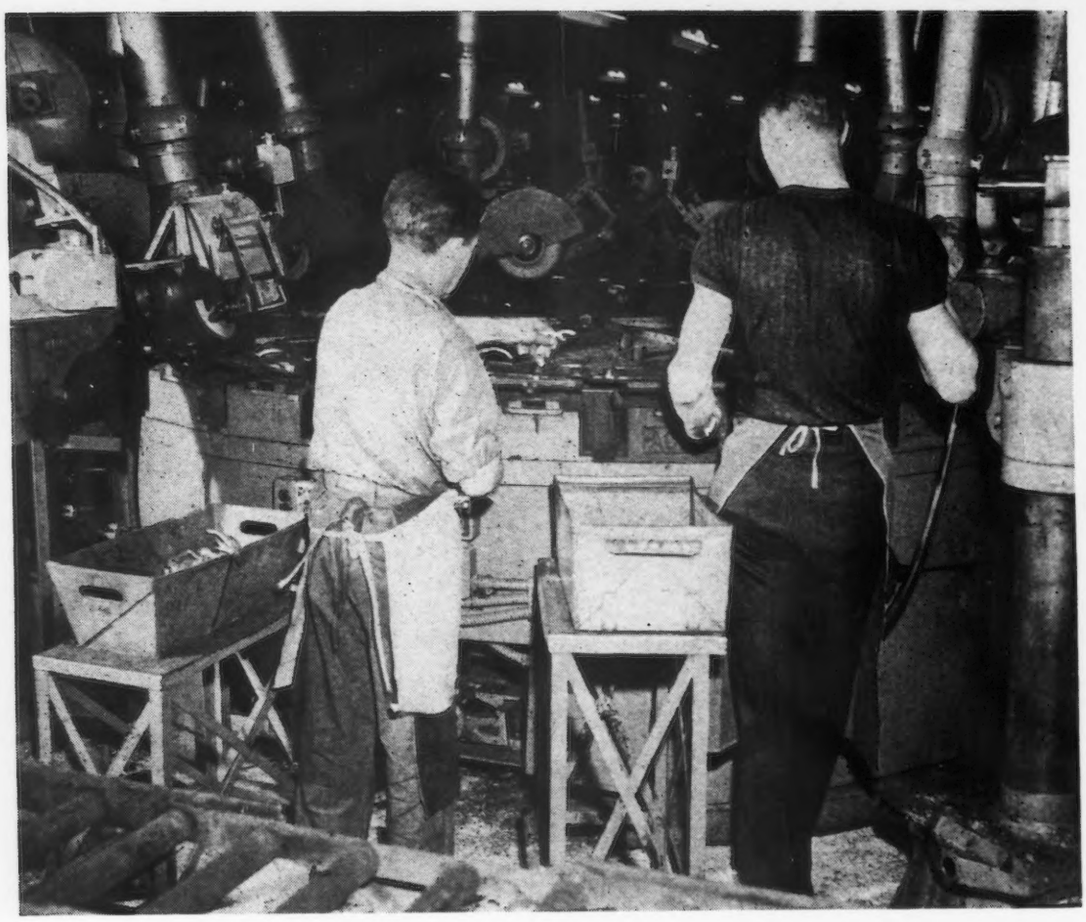


FIG. 4—Automatic machine for buffing inside door handle castings. Work is rocked to bring all surfaces to be buffed under each of the nine wheels.

highest grade of finish is not required, are subjected to tumbling in a soap solution with steel balls because the parts can be handled in bulk and with almost no labor, except for loading and unloading the barrels. The ball burnishing requires from 20 to 180 min per charge and while it does not produce as fine results as does buffing, it does yield a smooth and lustrous surface. Individual handling of parts is not required, as for buffing, and the barrels are much simpler and less costly to operate than any automatic buffing machine.

An average charge includes about 150 lb of castings, 150 lb of steel balls and about ¼ lb of soap chips plus enough water to cover the charge, which about half fills the barrel. All barrels are of iron, wood lined and are about 30 in. diam. They turn at 13 rpm and, when tumbling is complete, are discharged onto screens for separating the balls from the castings. Balls are of ⅛-in. diam or of such size as not to become lodged in the castings. After unloading, castings are well rinsed and are racked for plating as soon as possible to avoid discoloration of the burnished surfaces.

All castings to be plated, other than the small ones that are ball burnished, undergo buffing operations and all save a small part of such work is accomplished on automatic buffers. Most of these are rotary types but one straight-line machine, shown in fig. 3, is effectively used. All the automatic buffers have several wheels set at such angles that all significant surfaces are buffed before the castings are unloaded. Most such machines have devices for automatic feed of stick buffing compound to each wheel.

In the straight-line machine, used for outside door handles, the work is loaded by two operators who merely set the steel shank of each casting into a recess of a very simple holding fixture that is attached to a pair of constantly moving chains that advance the work under nine wheels. Only the stick compound applied at each wheel is needed. Having passed under the wheels, the castings are removed by two operators at the unloading end and are placed in tote pans with separators, for advance to inspection benches. The chains, with fixtures, return below the bed to the loading stations.

Similar in general principle but different in construction are circular machines, some of which have a horizontal rotating table with individual chucks or fixtures that turn on their own axes, and some, as in fig. 4, have fixtures that are advanced by a chain around the bed. In the latter type, cams are arranged to rock the fixtures so that side faces of the castings come under wheels that are set to turn in planes that are vertical or only slightly inclined. In this type of machine, some of which are used for interior door handles, the work is so rapid that one man loads and another unloads to keep step with the machine. The latter is equipped with nine polishing heads, each, of course, having its own exhaust duct and its own device for automatic feed of stick compound.

For buffing regulator handles and similar parts, a much smaller machine, fig. 5, having eight chucks on a table that revolves slowly is employed. In this machine, the chucks turn about their own axes as they are carried around the table. As in other ma-

FIG. 5—Small rotary buffing machine for regulator handles. At right is the pivoted holder for stick compound and the adjustable weight that presses the stick against the wheel.

chines, however, the wheels are so set that they reach all surfaces that require buffing. A single operator loads and unloads the parts. Three wheels, each with automatic stick feed, are sufficient in this setup.

Setup and adjustment of the automatic buffers are done by men trained especially for this work. Buffing of parts held by hand is confined to those processed in quantities too small to warrant automatic setups, to surfaces which cannot well be reached in automatic buffers or to touchup on castings which, for various reasons, do not pass inspection after coming from automatic machines. Castings that pass inspection after buffing are, in general, ready for plating which follows as soon as possible, so as to avoid any tarnishing that may occur if standing is permitted.

Cemented Carbide Strip Mill Rolls

SOLID Kennametal rolls for cold metal strip mills have recently been announced by Kennametal Inc., Latrobe, Pa. Service studies demonstrate that much more strip can be produced with these rolls than with conventional steel rolls before regrinding becomes necessary, and that thinner, harder materials can be rolled satisfactorily. More consistent accuracy of gage can be maintained, and a superior finish is imparted to the strip.

The great strength and hardness of the rolls provide long-wearing qualities under heavy loads, and the high modulus of elasticity, two to three times that of steel, more effectively resists deflection under high pressure. The rolls themselves, due to their close-grained structure, can be given a mirrorlike polish which is imparted to the strip, and finishes of 1.5 microinches are readily obtained on nickel strip, as against 10 to 12 produced with steel rolls. Equally good results are attainable in rolling carbon and stainless strip.

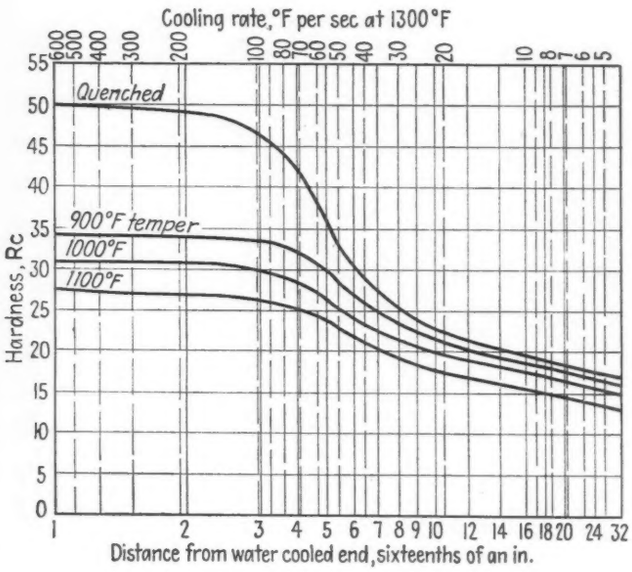
The non-galling properties of the material, that is, the resistance to pickup of carbide grains that roughen the surface, enable the rolls to hold their high luster, resulting in maintenance of rolled strip quality to a uniformly high standard. Torsion strength is superior to that of carbon steel, and only slightly inferior to alloy steels, making the rolls suitable for use where torque loads are transmitted, as when rolls are driven direct through the journals.

Hardenability Test for Quenched

WITH the development of the end-quench hardenability test by A. L. Boegehold and W. E. Jominy, a valuable tool was made available for easily predicting or measuring the metallurgical and physical characteristics of steels. The end-quench hardenability test ranks as one of the greatest contributions to the science of metallurgy because of its importance to both the steel user and manufacturer.

It is the purpose of this article to suggest two items which should be given more study to increase the useful application and practical interpretation of the end-quench test as applied to both forged and cast steels. Previous experimental data have verified the fact that both forged and cast steels respond identically to the end-quench test.

More study is required to extend the usefulness of the end-quench test to the final products which are in the great majority of industrial applications not in the as quenched but in quenched and tempered condition.



ABOVE

FIG. 1—Quenched and tempered end-quench data for a manganese-moly cast steel.

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FIG. 2—Calculated and actual transverse hardness; tempered at 1000°F.

Also, the end-quench test must be more carefully analyzed to determine its limitations in accuracy as imposed by practical variations in the uniformity of material in a given heat, and in the processing operations during heat treatment.

Application to Tempered Steels

One important application of the end-quench test is that of calculating the hardness gradient across various sized rounds or sections. Such determinations can be made quickly by means of an end-quench test, entirely eliminating the laborious process of treating various sized sections, cutting them transversely and making many hardness readings across the section.

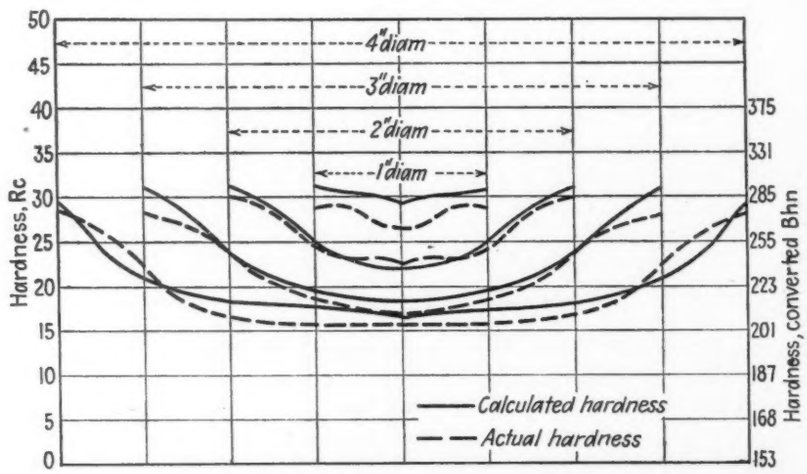
The procedure consists of quenching an end-quench bar, then tempering the bar at desired tempering temperatures. The hardness of the tempered end-quench bar at the position corresponding to the cooling rate at the particular location in the cross-section is the hardness at that point. The practical accuracy of this method is illustrated in figs. 2 and 3 by a comparison between actual and computed hardness gradients for a quenched and tempered cast steel of various cast sections based upon the quenched and tempered end-quench bar hardnesses plotted in fig. 1. Detailed instructions and comments on this procedure have been previously reported[1].

It is obvious that there are many practical applications of this test and its modifications to any section (symmetrical or not) in which the cooling rates at various locations are known. Information can be obtained as to:

(1) Cross-sectional hardness in the quenched condition.

(2) Cross-sectional hardness in the tempered condition.

(3) Tempering temperature required to produce a given hardness at any desired location of the cross-sections.



and Tempered Steel

By E. J. WELLAUER
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The practical application and interpretation of the end-quench test from the standpoint of forged and cast steels in the quenched and tempered condition are discussed in this article. Test data showing the relationship between tempered hardness and quenched hardness, as a function of the hardenability of the steel, are also presented.

(4) Hardness variations to be expected for a given tempering temperature for heats representing the range of hardenability obtained for a specific chemical analysis produced by the individual foundry.

(5) Predicting the physical properties after tempering by using the known relationship between Brinell hardness and tensile strength, etc.

These studies can be expedited by the fact that a fairly good relationship exists between various quenched hardnesses and the hardness resulting after a given time and temperature of tempering.

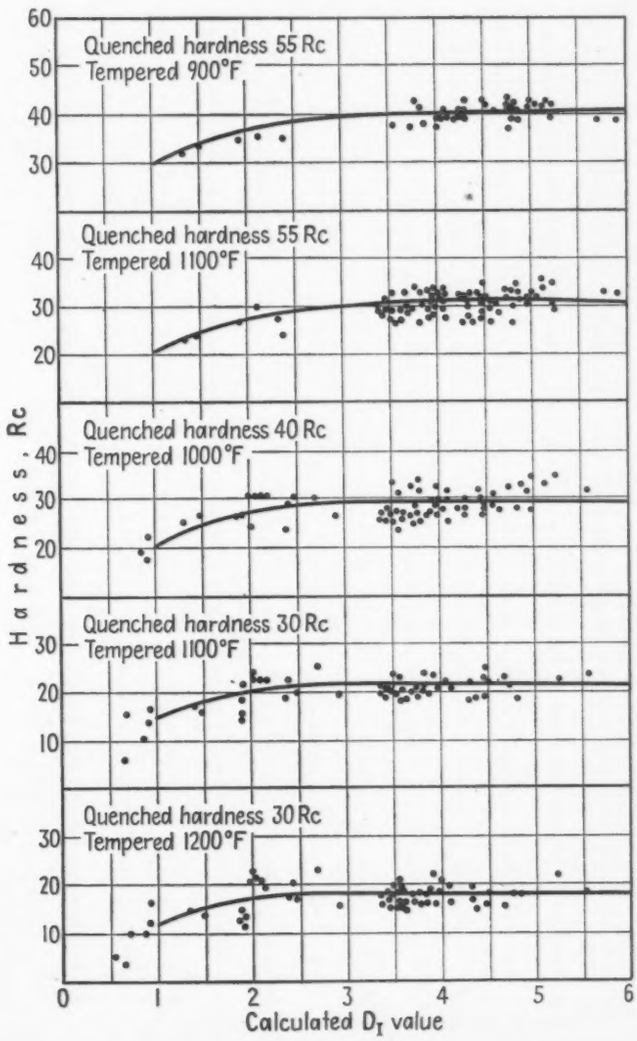
Typical test data from tempered end-quench bars for given quenched hardnesses for several tempering temperatures are plotted in fig. 4 against the computed D_I value. The data was secured from more than 200 tempered end-quench bars representing approximately 25 types of wrought and cast steels varying from 0.10 to 0.75 pct C in straight carbon and low and high alloy grades. All the data in this paper represent tempering periods of 1 hr at temperature. The results of different tempering periods can be approximated from the data presented by Hollomon and Jaffe[2]. No analyses are included which exhibit known precipitation hardening effects.

A detailed analysis of the data indicated that cast steels respond to tempering in exactly the same manner as rolled or forged steels.

The curves are important in that they indicate that

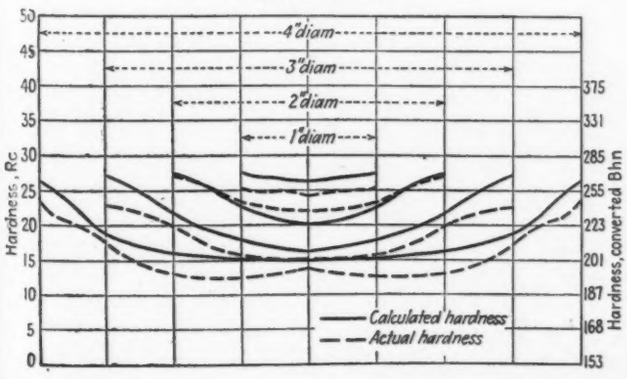
RIGHT

FIG. 4—Typical test data; comparison between tempered and quenched hardness.



BELOW

FIG. 3—Calculated and actual transverse hardness; tempered at 1100°F.



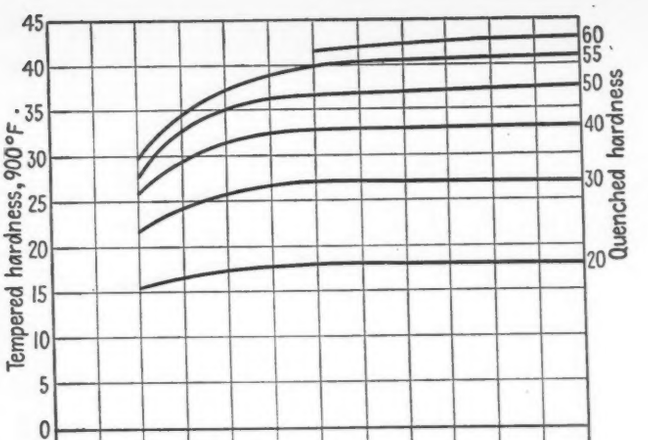


FIG. 5—Comparison of tempered and quenched hardnesses; tempered at 900° and 1000°F.

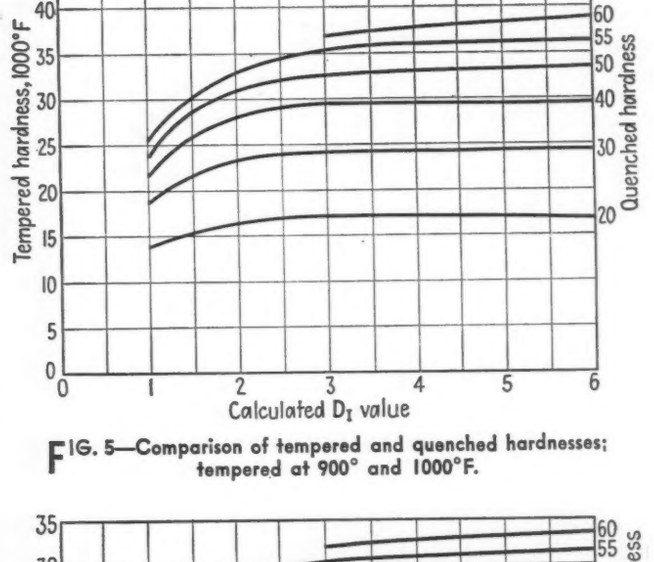


FIG. 6—Comparison of tempered and quenched hardnesses; tempered at 1100° and 1200°F.

tempered hardness is a fairly direct function of the quenched hardness for steels of medium to high hardenability. Although the data is limited at low hardenability values, indications are present that the tempered hardness for a given quenched hardness is lower for a definite tempering temperature as the computed D_I value decreases.

Although the data in fig. 4 show a scatter of approximately ± 5 Rc hardness, when the points are plotted for steels having chemical ranges within those commonly specified for a given commercial grade of steel the scatter is reduced to within ± 3 Rc.

It is the author's opinion that much of the scatter is due to the present inadequate information on the precise hardenability factors possessed by the various alloying elements acting singly or in combination with other elements and to the inconsistencies introduced into the end-quench test due to chemical segregations, and other factors. Cognizance must be given Engel's data[3] on the tempering of various structures, although it is doubtful whether this is important with the average 1 hr per in. tempering time customarily used in industry.

In the author's laboratory, the average tempered hardness curves (based upon tests) plotted in figs. 5 and 6 have been usefully employed in studying the tempering characteristics of various steels. After an end-quench hardness curve has been obtained, the reduced hardness for a given tempering temperature is obtained from figs. 5 and 6 and plotted. For D_I hardenability values over 3 the data in fig. 7 can be more conveniently used.

The data so obtained can be used for determining cross-sectional hardness gradients and other data previously discussed. Obviously, the data in figs. 5, 6 and 7 eliminate the necessity of tempering end-quench bars with a consequent saving of time and laboratory effort.

In several instances, even the initial end-quench test was computed and the tempered end-quench curves determined from figs. 5 and 6. This procedure has allowed studies to be made of certain specification ranges for which samples were not available for an end-quench test. The results obtained in this manner have been surprisingly accurate when later checked with actual samples. It has been found that the computed end-quench test (as quenched) is generally higher than the actual whenever there is a distinct slope over a narrow distance. The actual hardness is usually 1 to 3 Rc lower.

The author has had excellent results in using the data presented in this article as a basis of study for determining the minimum hardenability to specify for given production parts in order to maintain uniform conditions in the heat treat as well as to minimize machining difficulties in the shop. Such specifications are usually most severe when a considerable difference in section exists in the particular casting or forging.

As an example of hardenability specifications as determined by heat treat and production requirements, the simple part shown in fig. 8 requires a 24 to 29 Rc hardness on the large diameter on which gear teeth are to be cut. Previous experience indicates that for maximum wear resistance and economical tool life a carbon content within the range of 0.45 to 0.55 pct

is desirable. Because of the loading conditions of the gears, the exact percentage of martensite at ½ radius is not too important.

Because of the extensive precision machining on the 1 in. and 2 in. diam, machining requirements demand that the hardness be maintained fairly low. Cost factors would prevent tempering the ends in a separate operation. Minor modifications in rough machining dimensions allow different heats of the steel to reach the heat treat at the same time. For maximum production, these parts should be tempered with minimum variations in tempering temperature. The steel is to be oil quenched. These are the limitations imposed by production. For the preliminary selection of a steel, it is decided to use a low alloy steel for reasons of economy.

For a low alloy steel, available end-quench tests indicate that the hardenability band is as indicated in fig. 9. Common to many low alloy steels, the band range is wide since a small difference in composition easily encountered in melting makes a considerable variation in hardenability. The study must indicate what minimum hardenability is required so that the melter can properly watch the analysis for the particular heats from which the part is to be made.

First, the tempered end-quench hardness is determined by test or figs. 5, 6 or 7, and plotted as in fig. 9. Next, the cross-sectional hardness is determined using the tempering temperature giving the required hardness on the diameter of the 1 in. and 4 in. section. This is done for the maximum and minimum hardenability ranges, fig. 10.

Analyzing the data, it is seen that the tempering temperature required to produce the specification range on the 4 in. section will probably range between 900° and 1250°F. The hardness in the 1 in. diam will vary between 40 and 30 Rc, the higher limit being too hard for the proper machinability. These ranges are too large and adjustments must be made. Since the 1 in. diam is small, the minimum end-quench test corresponding to the 4 in. section must be raised to make conditions more uniform. Successive trials are made until the required conditions are met as illustrated in fig. 11 with a minimum hardenability curve as plotted in fig. 12.

Knowing the frequency curve of the D_I values as determined from experience, a tempering temperature should be selected which would produce the specified hardness range for the greatest number of heats. The heat treat department would then be furnished the calculated D_I values for each heat. When the D_I value is below or above that conforming to the range covered by the predetermined tempering temperature, the heat treating department would adjust the tempering temperatures accordingly.

It is recommended that the foundry producing heats to hardenability specifications maintain a continuous record of the frequency distribution of the D_I values. The information obtained will be of considerable value, particularly when making adjustments in the event of trouble in the foundry or in the customer's heat treating department.

The presentation of this problem using intentionally wide limits illustrates that a hardenability specifica-

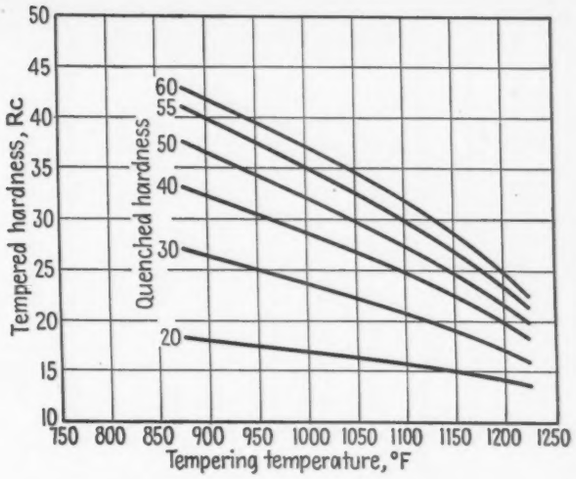


FIG. 7—Tempered and quenched hardness for D_I 3.00 to 6.00, at 900° to 1250°F temper.

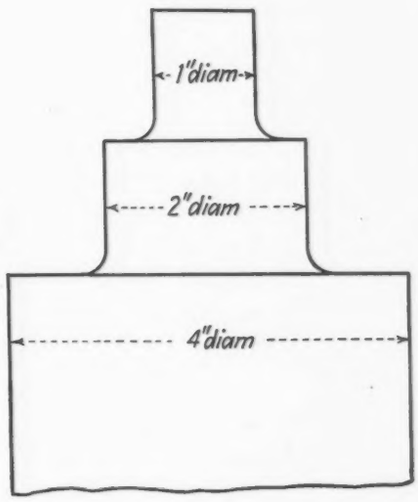
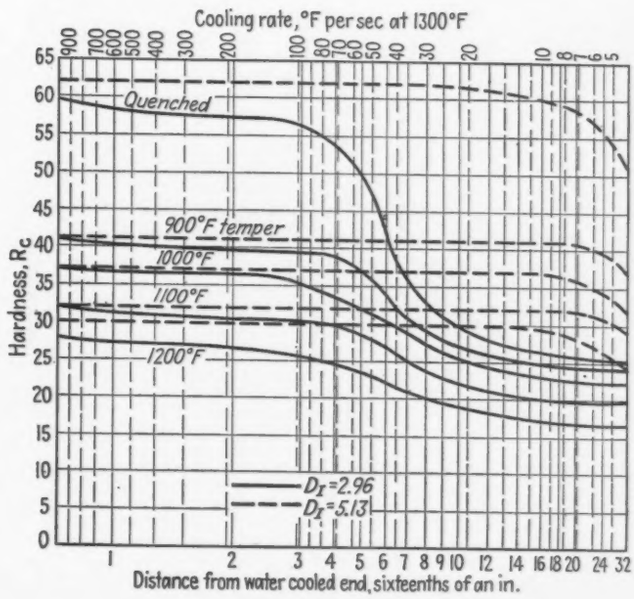
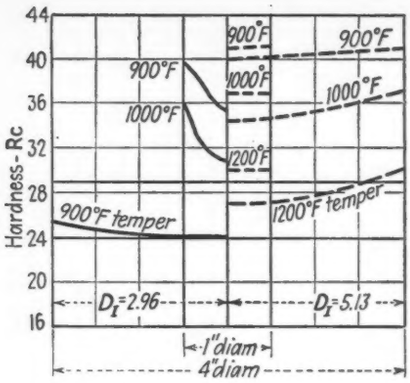


FIG. 8—Dimension of part requiring hardenability specifications.

FIG. 9—Hardenability band—quenched and tempered—of a low alloy steel.





LEFT

FIG. 10—Tempered transverse hardness for minimum and maximum hardenability.

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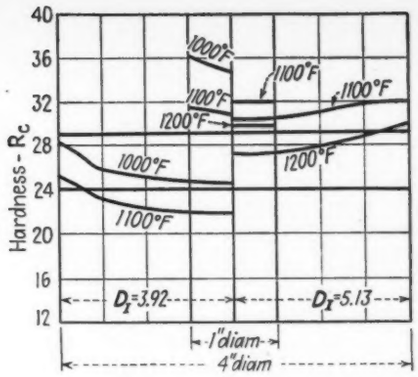
RIGHT

FIG. 11—Transverse hardnesses obtained with adjusted hardenability range.



tion based upon an individual section of a mechanical part requires a study of all the problems associated with the production procedures of that part. A mere metallurgical selection of a chemical composition to meet the specified hardenability requirements might still result in a dissatisfied customer.

In addition to the data previously discussed it is necessary to analyze the practical variables which might affect the theoretically expected results. There is a tendency on the part of some metallurgists to treat the hardenability test as a precise mathematical solution. The accuracy as measured by the actual production results is dependent upon the limits imposed by the practical variations in the uniformity of the material, quenching process and test method acting singly and collectively.

Factors Influencing Hardenability

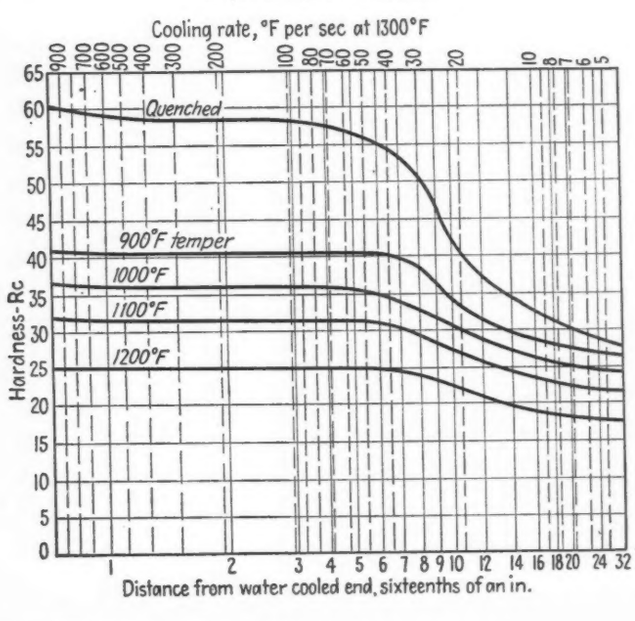
The influence of chemical segregation on the end-quench test results in finished parts for forged or rolled steels is adequately presented in the paper by H. L. Walker and associates.[4] Cast steel in lighter sections has less segregation than forged or rolled steels of comparable section. However, in larger sections the segregation might be sufficient to materially affect the results predetermined by individually cast end-quench bars or even cut from a particular location in the section.

For accurate determinations of tempered hardnesses, it is suggested that the end-quench bar be tempered. The same bar can be tempered several times provided each successive tempering temperature be increased and a new hardness reading flat ground. The results will be the same for tempering periods of 1 hr as that obtained by using a separate end-quench bar for each tempering temperature. It is suggested that reference be made to the paper by Hodge and Orehoski[5] showing the variation which can exist between the calculated and actual percentages of martensite for various carbon contents.

Because of the demonstrated variations between the laboratory end-quench test and production results, it is the author's opinion (and practice) that additional specifications involving chemical specifications is entirely justified. In view of the service requirements certain ranges of carbon or alloys might be required, the demands of uniform machinability in either the annealed, normalized or heat treated condition requires more than a simple hardenability specification. It would appear, therefore, that before the foundryman produces a steel to the simple hardenability data contained in the SAE or other specifications, a complete discussion with the customer is necessary.

o o o

FIG. 12—Adjusted minimum hardenability required for example discussed in article.



This article is an extended abstract of a paper presented at the recent annual technical and operating meeting of the Steel Founders' Society of America, in Columbus, Ohio.

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[2] J. H. Hollomon and L. D. Jaffe, "Time-Temperature Relations in Tempering Steel," Metals Technology, AIME, September 1945, 12, No. 6.

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[4] H. L. Walker and E. J. Eckel, J. Hinoand, F. H. Mueller, "Hardenability of 4150 Steel-Effect of Segregation," Metals and Alloys, February 1944.

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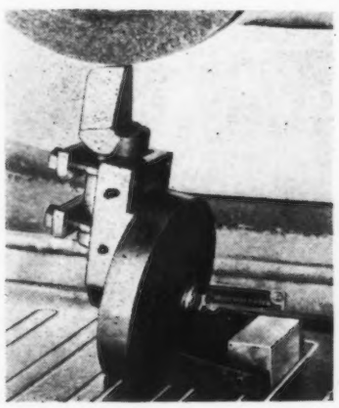
New Equipment . . .

Small Tools and Gages

Improved models of grinding fixtures, circle cutters, dieheads, threading dies and setup blocks are among the announcements in this week's review, which also includes various types of measuring gages, form tool setting gages, gage sets and attachments.

DEVELOPMENT of an all-purpose tool grinding fixture for the precision grinding of lathe tools, screw machine form tools, shaper, planer, milling machine or any angle cutting tools, has been announced by the *George Scherr Co.*, 200 Lafayette St., New York 12. The fixture works on a principle involving the use of compound angles. It is placed on the magnetic chuck of a surface grinder



and is held in place by the magnetic power of the chuck. It is graduated by degrees up to 90 and angles both left and right may be readily obtained. In addition, and at the same time, the rake angle is ground on the tool by means of a tipping block, which gives 3, 5, 7, and 10° clearance. Tools, both inside and outside threading and recess tools, from ⅛ to 1¼ in. may be ground on the All-purpose which is used for carbon, alloy and tungsten carbide tool bits.

Ground Thread Dies

INTRODUCTION of ground thread flat rolling dies for use on Waterbury Farrell, Manville, National Bolt Maker, and National Electric Jr. and Sr., thread rolling machines has been made by the *Jones & Lamson Machine Co.*, Springfield, Vt. Maximum length of these dies is equivalent to No. 40 Waterbury Farrell or 10 in., and they can be supplied in widths up to 8 in. A standard type of starting and leaving end has been established for the short die, which, with the thread form are ground into the die in one operation. All dies are matched, and the elimination of shims is said to speed setup time. Single face, duplex and step type dies are available in all thread forms.

Feed Tubes

A LINE of shock-absorbing feed tubes for Brown & Sharpe automatics which do not have a springy safety device incorporated in the feeding mechanism of the machine, has been announced by *Modern Collet & Machine Co.*, 401 Salliotte St., Ecorse 18, Mich. With these feed tubes, forward movement of the screw machine feed latch is transmitted from the spool to the tube itself through a sleeve and helical compression spring. This spring permits normal feed without deflecting; but in case of interference with advance of the feed tube, the spring compresses and the spool slides forward freely on the tube, it is said, thus preventing breakage of the feeding mechanism or damage to the feed tube.

Adjustable Circle Cutter

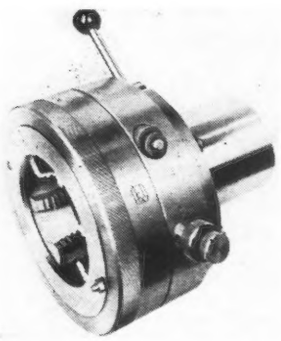
FOR cutting large-size holes in wood, steel, brass, hard rubber, aluminum, plastics and problem materials which might necessitate use of torches or other expensive equipment, *Bruno Tools*, Beverly Hills, Calif., has manufactured an all-purpose adjustable hole-cutting tool which cuts holes to any diameter from 1⅞ to 8 in. through ¼ in. thickness in steel or other tough metals and any thickness up to 1½ in. in plastics, fiber or wood. The tools are designed to operate in any standard drill press, woodworking machine, or suitably mounted spindle machine. The cutter consists of a combination drill and pilot with a high speed cutting blade, adjustable to depth and diameter. The Wedge-lok cutting blade holder permits the cutting

edge to recede or yield from work while still maintaining steady pressure and feed. The cutting blade is resharpened without special tools by grinding on one edge only.

Self-Opening Die Head

AUTOMATIC self-opening die heads of the radial chaser type have been developed by the *Jones & Lamson Machine Co.*, Springfield, Vt. Threading capacities range from 2½ to 4 in. for heavy duty threading and up to 4¼ in. for 8 pitch threads and finer. Dies are hardened and

ground on all working surfaces. The chasers are ground in the thread form after hardening and are guaranteed to hold lead correct within 0.001 in. per in. The ac-



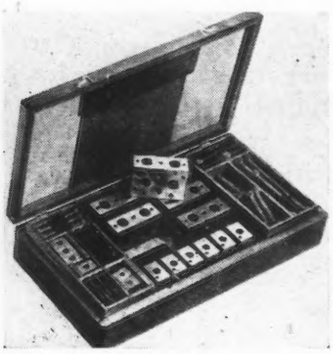
curacy of the form, as well as the correctness of the lead, will produce threads to specifications of Class 3 fit, American National Standards. The built-in, eccentric float combined with longitudinal float makes the tool suitable for heavy saddle type turret lathes.

Abrasive Wheels

A COMPLETE line of resinoid-bonded diamond abrasive wheels has been announced by the *Wickman Corp.*, 15533 Woodrow Wilson Ave., Detroit 3. Designed particularly for sharpening carbide tools, these diamond wheels are said to provide a faster cutting action than ordinary wheels without the usual tendency to heat up. Diamond hand hones are also available for touching up tool setups where considerable time would be lost in removing the tools for grinding.

Parallel Setup Blocks

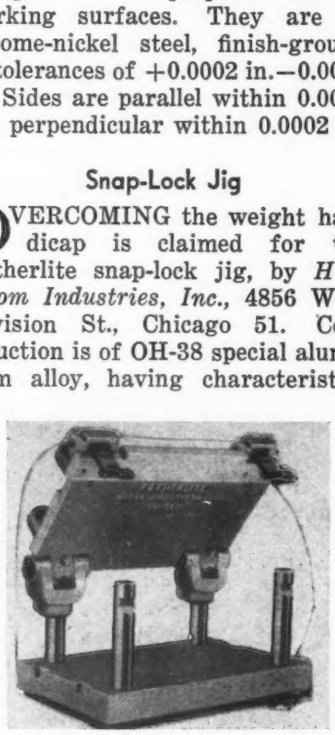
THREE-WAY parallel setup blocks, which build up to 12 different heights and are said to take the place of a large number of



conventional parallels, have been developed by the *Moore Special Tool Co., Inc.*, Bridgeport, Conn. The complete set consists of six each of two sizes, 1 x 2 x 3 in. and ⅞ x 1¼ x 1½ in. packed in a box for operator convenience. Each block can be used in any of its three dimensions, and are adaptable for large or small work. The blocks are drilled and counterbored for bolting to the machine table or faceplate and will not slide off, it is said, when attaching work to a vertical surface. Tapped holes on all three sides for supplementary straps permit work to be supported parallel or perpendicular to working surfaces. They are of chrome-nickel steel, finish-ground to tolerances of +0.0002 in.—0.0000 in. Sides are parallel within 0.0001 in., perpendicular within 0.0002 in.

Snap-Lock Jig

OVERCOMING the weight handicap is claimed for the Fetherlite snap-lock jig, by *Hedstrom Industries, Inc.*, 4856 West Division St., Chicago 51. Construction is of OH-38 special aluminum alloy, having characteristics



of toughness, durability and easy boring for bushings and pins. Its lightness, ⅓ the weight of steel, makes possible easy shifting to any position. A special feature is hand-operated clamp screws which hold the work-piece in place. Quick-latch automatic clamp screws are also available. The unit is easily assembled into a 1, 2, 3, or 4-way jig. Interchangeable posts accommodate work of practically any height.

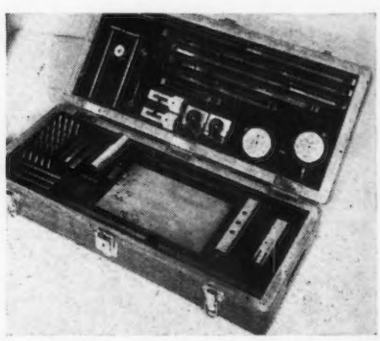
Portable Thread Gage

SAID to provide fast, accurate inspection of internal threads in parts where bench inspection is inconvenient or while parts are still in the machine, a portable thread gage has been produced by the *Bryant Chucking Grinder Co.*, Springfield, Vt. Because of its design, the gage not only visually indicates the accuracy of internal threads, but also shows any out-of-round condition that may exist. The gage has three thread segments, two stationary and one attached to a movable arm. By pressing the operating lever, the movable segment is retracted forming a pilot which can be inserted into the work

without thread interference. Releasing the operating lever engages the segments with all the internal threads, a partial turn of the gage inspects the threads all over. At the same time overall accuracy, or accumulated inaccuracies of lead, pitch diameter and thread form or presence of burrs are indicated. Inspection of different size threads is accomplished by changing the segments.

Gage Kit

A GAGE kit, called the Producto-Chek, has been designed by the *DoAll Co.*, 1301 Washington Ave., S., Minneapolis 4, for production checking. It consists of a number of instruments to be used in conjunction with gage blocks for setting up practically any type of inspection gage. A few examples of these are the dial indicating snap gage, plain and dual bench comparators, angle and square comparators, precision height gage,

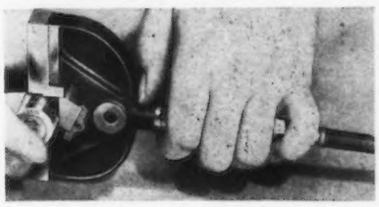


depth gages and a series of go-no-go snap gages of any size up to 18 in. Plug gages and internal gages of any size in steps of 0.0001 in. can be quickly made up from the set, it is said. In addition gages can be made up for special applications. A set of holders from 2 to 18 in. in

length are designed to carry the gage blocks. Besides hand gages, a whole series of bench and surface plate gages can be assembled.

Air Gage Attachments

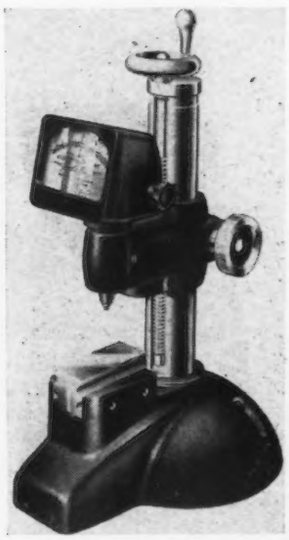
STANDARD adjustable Airsnap fixtures for use with Precisionaire instruments have been produced by the *Sheffield Corp.*, Dayton 1, to provide desirable flexibility in checking by air external dimensions



of work in or at the machine or at the bench. They are available in eight models covering a range from 0.0250 to 2.000 in. inclusive. These adjustable Airsnaps can be used with Precisionaires on dimensions with tolerances ranging downward from 0.002 in. Special adjustable Airsnaps may be used for checking to tolerances of 0.0002 in. down to ten-millionths or less. Each adjustable fixture has a built-in balanced airflow accuracy so the reading does not change if one anvil is closer to the part than the other.

Electronic Comparator

FOR external measurements, an electronic comparator, Model AC, has been produced by *Jack & Heintz, Inc.*, Cleveland 1. This unit



takes precision external measurements of parts having infinitely close tolerances. It is said to be equally satisfactory for rapid inspection of production parts or, with a more sensitive calibration, for checking gage blocks or other reference gages. The gaging head is removable from the comparator stand for use with other fixtures in making many types of measurements. Graduations are available of 0.0001 to 0.000005 in. and ranges of ± 0.0025 of ± 0.000125 in.

Thread Gage Sets

STANDARD reversible gage sets in cabinets have been put on the market by the *Size Control Div., American Machine & Gage Co.*, 4636 W. Fulton St., Chicago 44. They are made up in partial or complete thread series. Plain plug gages, also of reversible design, are made in the old or new ASME recommended drill sizes, in fractional sizes in any combination of increments of 0.001 or by any other size arrangement. These sets are of

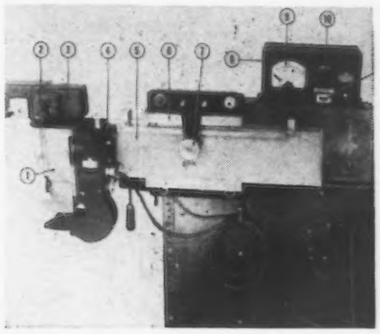
special value in experimental laboratories, or shops requiring gaging of many different short run operations.

Gage Sets

COMPLETE standard gage sets housed in durable cabinets have been made available by the *United Precision Products Co.*, 3524 W. Belmont Ave., Chicago 18. Cabinet No. 500 contains 471 gaging members for cylindrical plug gaging, sizes 0.030 to 0.500 in. in increments of 0.001, each member with its own plastic collet, seven lightweight handles and four drifts. Gaging members are progressively stored and size of gage is stamped on collets for instant pickup. Cabinet No. 600 contains 501 gaging members in four drawers. Sizes range from 0.500 to 1.000 in. in increments of 0.001. Plastic collets are included for each pin; also four lightweight handles and four drifts. Gaging members are available in XX, X, Y, Z, and ZZ tolerances.

Gage Control Unit

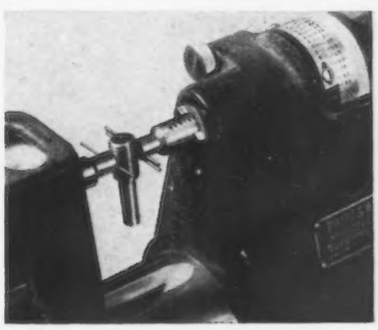
ANNOUNCED by *Pratt & Whitney Div. of Niles-Bement-Pond Co.*, West Hartford, Conn., is a remote control unit for use with their continuous electrolimit gage. This unit, when combined with this P&W gage, will allow remote con-



trol operation. The handwheel setting knob on the gage head is replaced by a reversing Selsyn motor and worm gear drive. The counter, which indicates the gage setting on the head, remains undisturbed. The remote control setting cabinet contains a Selsyn motor, counter, plus and minus toggle switch and an indicating meter. The unit is sturdily built and designed for steel mill use.

Measuring Wires

ANNOUNCEMENT has been made of a line of thread and gear measuring wires made of Carboloy cemented carbide by *Lincoln Park Industries*, 1719 Ferris Ave., Lincoln Park 25, Mich. These measuring wires are ground and lapped to standard tolerances closer than Bureau of Standards specifications.



Through the use of cemented carbide, it is claimed accuracy is retained at least 50 times longer than can be expected of steel wires, and possibility of flats developing, with resultant inaccurate readings, is eliminated. These wires are supplied in sets of three, labelled to show size of wires and number of threads per inch.

Optical Micrometer

FOR gaging transparent plastics and glass in curved shapes and in inaccessible spots, an optical micrometer has been developed by *Aireon Mfg. Corp.*, 166 W. Olive Ave., Burbank, Calif. The instrument consists of a microscope which can be screwed up and down in an outer plastic tube. The lower end of this tube is a plastic nosepiece that is held against the transparent sheet to be measured. The sheet is marked with a crayon on the side away from the instrument and the measurement consists in sharply focusing the mark in the microscope. The readings on the barrel and thimble give directly the thickness of the sheet. The micrometer is scaled to 0.001 in. and operates on two scales, from 0.0 to 0.4 in. and from 0.4 to 1.5 in.

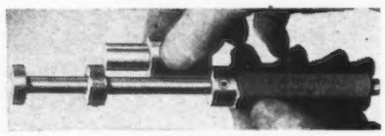
Pin Gages

COMPLETE sets of either numbered, lettered or fraction type drill size pin gages, all in one case, have been introduced by the *Horberg Gage Co.*, 19 Staples St., Bridgeport 1, Conn.

Twin gages of each size are held upright in the case and each pin is identified for quick selection. Gages are made to tolerances of + 0.0001, − 0.0000 of oil hardened tool steel and tapered half-way up the shank for easy insertion. Round, polished top and flat, ground bottom are other features.

Adjustable Length Gage

FOR quick checking of length dimensions especially in production parts having more than one length dimension that must be held within given limits, an adjustable length gage has been designed by the *F. H. Smith Mfg. Co.*, 3037-3047 Carroll Ave., Chicago 12. The tolerances of 0.005 and 0.010 in. are ground on either end



of the adjustable limit ring as marked, while the fixed end and adjustable handle are ground flat. The gage is available without the adjustable limit ring or with one or more limit rings, giving several combinations of tolerances in multiples of 0.005 up to 0.020 in.

Tool Setting Gage

DESIGNED primarily for use on Brown & Sharpe automatic screw machines for resetting the cutting edge of the form tools in precisely the same position from which they were removed before

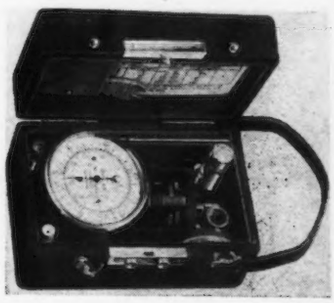
sharpening, a form tool setting gage has been produced by the *F. H. Smith Mfg. Co.*, 3037-3047 Carroll Ave., Chicago 12. Operators are able to remove the tool and return it to the exact former position without further adjustment. With this gage, both front and back slides can be set with equal speed and accuracy. The spindle may be running in either direction. The gages are made in three sizes for No. 0, 00, or No. 2 machines and can also be used on other screw machines and lathes.

Adjustable Quadrangle

ANGLES from 0 to 90°; pitch scales from 0 to 24/12; percentage slopes from 0 to 100 pct; sine or cosine functions and tangents may be found with the adjustable quadrangle designed by *Stewart-Jackson Instrument Co.*, A. G. Bartlett Bldg., Los Angeles 14. This instrument has eight drawing edges, is rectangular in shape, and may be used as a triangle. The body and arm of the instrument is blank allowing the owner to add his own most-used cut out symbols and measuring scale. Overall size of this plastic drafting tool is 4 x 11 in.

Hand Tachometer

EQUIPPED with carrying case and accessories, O-Z improved hand tachometers with rotating gear shift have been announced by *O. Zernickow Co.*, 15 Park Row, New York 7. They are designed to



indicate without timing or calculating of any sort: The rpm of revolving objects, surface or peripheral speeds in fpm, speed variations occurring during a fraction of a revolution, belt slipping and, consequently, waste of power. They are accurate within ½ of 1 pct, it is claimed, and are perfectly balanced for use horizontally, vertically or in any other position. Outside influences do not affect the tachometers. They come with a 3-in. dial and quintuple range.

Dial Bore Gage

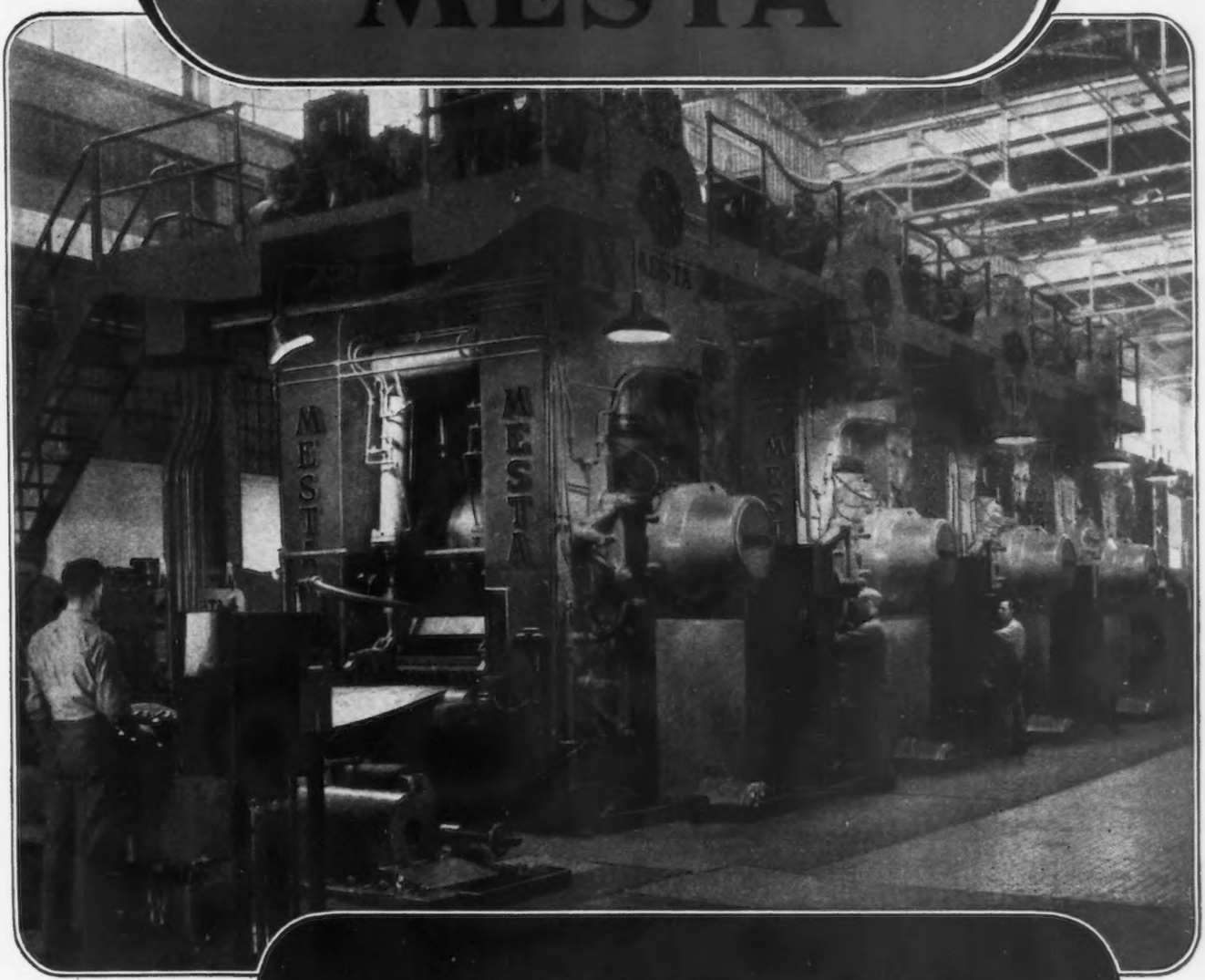
WITH the announcement of its No. 0 dial bore gage, *Standard Gage Co.*, Poughkeepsie, N. Y., has extended the range of this type of instrument down to ⅜ in. This gage employs the same fundamen-

tal positioning principle used in the larger sizes: two centralizing plungers, which act together, assure that the line of measurement passes through the center of the bore at all times. Operating the gage consists of merely inserting, rocking, and noting the greatest deflection of the hand as the reading. The dial bore gage is furnished with an indicator graduated in either 0.0001 in. or 0.002 mm. said to be accurate within 0.00002 in.

FOUR-HIGH COLD MILLS

Designed and Built by

MESTA



FOUR STAND TANDEM FOUR-HIGH MILL
FOR THE COLD REDUCTION OF THIN
SHEET STRIP AND GALVANIZING STOCK

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Assembly Line . . .

WALTER G. PATTON

• Detroit employment hits peacetime high . . . Low worker productivity only one factor in the present labor shortage. Many skilled classifications short.

DETROIT—How is it possible to account for the fact that it apparently requires nearly as many workers today to produce one-third as many motor cars as it did in 1929 or 1941? The Industrial Employment Index compiled by the Detroit Board of Commerce stood at 139.2 on Aug. 15; and the figure for the first seven months of this year was, despite the steel strike in February and the Ford lay-off in May, within 11 pct of the average for the first half of 1929. The average employment figure for the first half of 1946 was 118 compared with 121.5 for the first six months of 1941. Yet the automobile industry is producing less than one-third as many cars in 1946 as were assembled in 1929 and 1941.

Those who like to take their exercise jumping at conclusions will probably decide that the difference in the car production-employment ratio for 1946 and 1929 simply reflects the decline in worker productivity and let it go at that. However, the answer is obviously not as simple as this—and for a number of reasons.

For one thing, the average number of hours worked in automobile plants today is a great deal less than it was in 1929. According to the Michigan Dept. of Labor Statistics, the average number of hours reported per worker during the first seven months of 1946 was 35.5. Although exact figures are not available for 1929 it is believed the average number of hours worked at that time was about 44 hr per week—the same as the 1928 figure. It should be observed that the employment index indicates the number of workers on the payroll; it does not reflect the total number of manhours expended to produce automobiles.

It is also important to note that no large industrial plant ever managed to operate efficiently during a period when materials and supplies could not be handled in a predictable manner. This may mean, in the automobile industry, the scheduled delivery of materials and parts directly from freight cars or trucks to assembly lines. It also means ability to plan materials flow weeks in advance of actual production. Obviously such planning is clearly impossible during a period when automobile supplies are available only on a hand-to-mouth basis—and sometimes not at all.

ANOTHER partial explanation for the present high labor index is the fact that manual labor is being used at present in automobile plants largely because labor-saving materials-handling and other equipment is not yet available. Backlogs for the mechanical handling industry are known to be high. The fact that such equipment can usually be introduced without subjecting the user to charges of "speed-up" adds further to its present attractiveness.

The automobile industry is currently doing a considerable amount of research and development work that is not yet reflected in production figures. Many additional manhours are required under today's operating conditions simply to chase materials. The changes in engineering specifications which are necessary because of materials shortages also require additional manpower, most of it technically trained. The fact that all automobile producers are known to be working feverishly on new models has also resulted in substantial additions to the labor force.

Automakers Lose

Detroit

• • • During the first 6 months of 1946 passenger car manufacturing companies report a net loss of $45,231,001 according to a survey recently completed by the Automobile Manufacturers Assn.

Calculated after allowances for tax credits under excess profits tax carry-back provisions, the loss reported is equivalent to 3 pct on every dollar of sales. The loss is approximately one-half of the 6.7 pct loss reported in 1932. According to the association, passenger car companies averaged 3.97 pct return on sales in 1945; 2.6 in 1944; 3.1 in 1943; 3.56 in 1942; 6.45 in 1941; 7.07 in 1940, and 8.25 in 1939.

Since the demand for replacement parts in the automobile industry stands today at an all-time high, the number of workers engaged in the production of automotive parts for vehicles in operation is considerable. While these workers will naturally be included in the Employment Index there will be no corresponding increase in vehicle production.

The problem of individual worker productivity, as everybody knows, is an important factor in the present situation, but many people are inclined to attribute to this factor more emphasis than it deserves. It should not be overlooked that workers at the present time do not have the usual incentive to work hard at their job when they may be laid off the following morning for lack of materials and parts.

THERE seem to be many factors affecting auto production other than indifference by the worker, lack of training, slowdowns and other explanations which are often advanced to account for the present low productivity of the automotive industry. To be sure, low productivity by the worker applies in many individual plants and to many individual workers, but low worker productivity cannot by itself explain satisfactorily the difference between the number of workers em-

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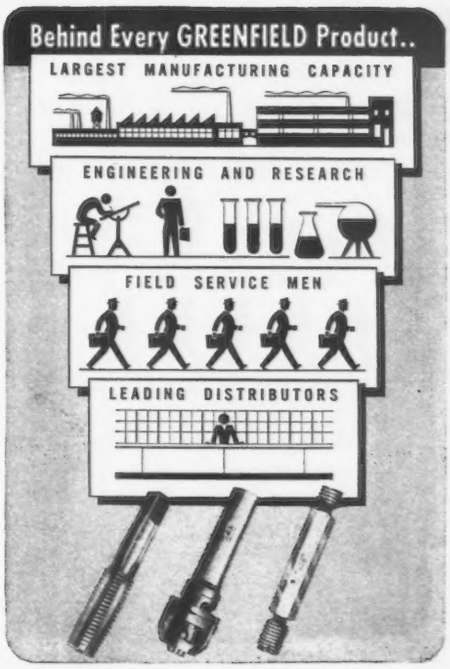

ployed by the automobile industry today and the number of cars being turned out.

Any comparison between the number of workers employed today and in 1929 by the automobile industry should also take into account differences in weight of the cars, the number of parts and gadgets per car (which is obviously much higher today), the use of mechanized equipment in place of manual labor and many other factors which are obviously next to impossible to evaluate.

There are, of course, many aspects to the present automotive labor picture that leave much to be desired. The Detroit Employers' Assn. has had difficulty interesting unemployed workers in available jobs. Many workmen seem to have decided to live off their present savings and compensation for several months yet and are apparently in no hurry about getting a job.

Under existing unemployment regulations in Detroit, the maximum compensation a worker can draw in a 2-yr period is 40 weeks. A recent survey by the Michigan Unemployment Compensation Commission showed that 28 pct of the workers on the rolls were repeaters from the previous period. However, these repeaters are rapidly weeded out as new employment is found for them or they turn down a bona fide job offer in which case they may be removed from the rolls. Most of the repeaters are women.

Statistics compiled by USES show that total employment in Detroit reached a new peacetime high in June and continued upward in July. Between June and July 22,000 were added to payrolls. Total employment as of mid-July is estimated to be 1,029,000. Between July and September it is expected that major manufacturers in this area will add 20,000 workers.

Unemployment remains relatively high, however, (103,000) partly because many of those classified as unemployed are actually unavailable for jobs or cannot meet employers' qualifications.

Labor turnover is high. In May, for example, one out of every 14 Michigan workers were separated from employment voluntarily or due to layoffs. The Detroit turnover figure was 7 pct; the ratio in Pontiac was 12 pct; in Grand Rapids and Muskegon 8 pct. This figure does not include struck plants, but does include those plants where workers were laid off because of strikes in other plants. Separations in Detroit in May for reasons other than layoffs were 4.2 pct; the corresponding figure for June is 4.6 pct.

According to USES the scarcest skilled labor classifiations in Detroit at present are sample body builders, die sinkers, sheet metal workers, bricklayers and metal finishers. The agency adds further that existing needs for production workers could easily wipe out the present file of male applicants in skilled and semiskilled trades if the registered workers matched available job requirements.

In view of the present situation one wonders how Ford will be able to expand its labor force from 123,000 to 132,000 as recently announced; how Hudson will be able to find 2000 extra workers for its plant; and how GM, Chrysler and other employers' requirements are going to be met in the months immediately ahead—especially, if housing remains, as at present, the biggest bottleneck in the employment problem.

HYDRAULIC OLDS: *Latest car off the Oldsmobile assembly line in Lansing is the series "98" convertible coupe equipped with a power-operated top. Hydraulic power also operates the door windows and the adjustable front seat. The car is powered by 110 hp straight eight motor, has a wheelbase of 127 in. and offers Hydramatic drive as optional equipment.*

Indiana Group Gets Bid For Surplus Aircraft

Washington

• • • **A high bid of $629,000 for 2265 surplus combat aircraft and an estimated 14,000,000 of aircraft scrap located in Hawaii has been accepted by WAA.**

The successful bidder was an Indiana group composed of the Rolling Mill Scrap Baling Corp., Kokomo; South Bend Baling Co., South Bend; Harold D. Gamrath, Kokomo; and Nathan Liff, Mishawaka. The low bid of eight, $51,050, was submitted by a West Coast firm.

Under conditions of the award all material must be removed from the government's salvage dump on the island of Oahu within 22 months. The aircraft cannot be used for flight purposes.

Named to Gray Iron Div.

Chicago

• • • **Appointments to the 1946-47 analysis of castings' defects committee of the gray iron div. of the American Foundrymen's Assn. have been announced by T. E. Eagan, Cooper-Bessemer Corp., Grove City, Pa., division chairman. Members of the new committee include:**

W. A. Hambley, Slinger Foundry Co., Slinger, Wis., chairman; W. B. McFerrin, metallurgist, Electro Metallurgical Co., Detroit, co-chairman; George Anselman, service engineer, Goebig Mineral Supply Co., Chicago; T. E. Barlow, metallurgist, Battelle Memorial Institute, Columbus; A. S. Klopf, senior engineer, Lester B. Knight & Associates, Chicago, F. L. Overstreet, foundry engineer, Illinois Clay Products Co., Chicago, and Charles Zahn, foundry superintendent, Vilter Mfg. Co., Milwaukee.

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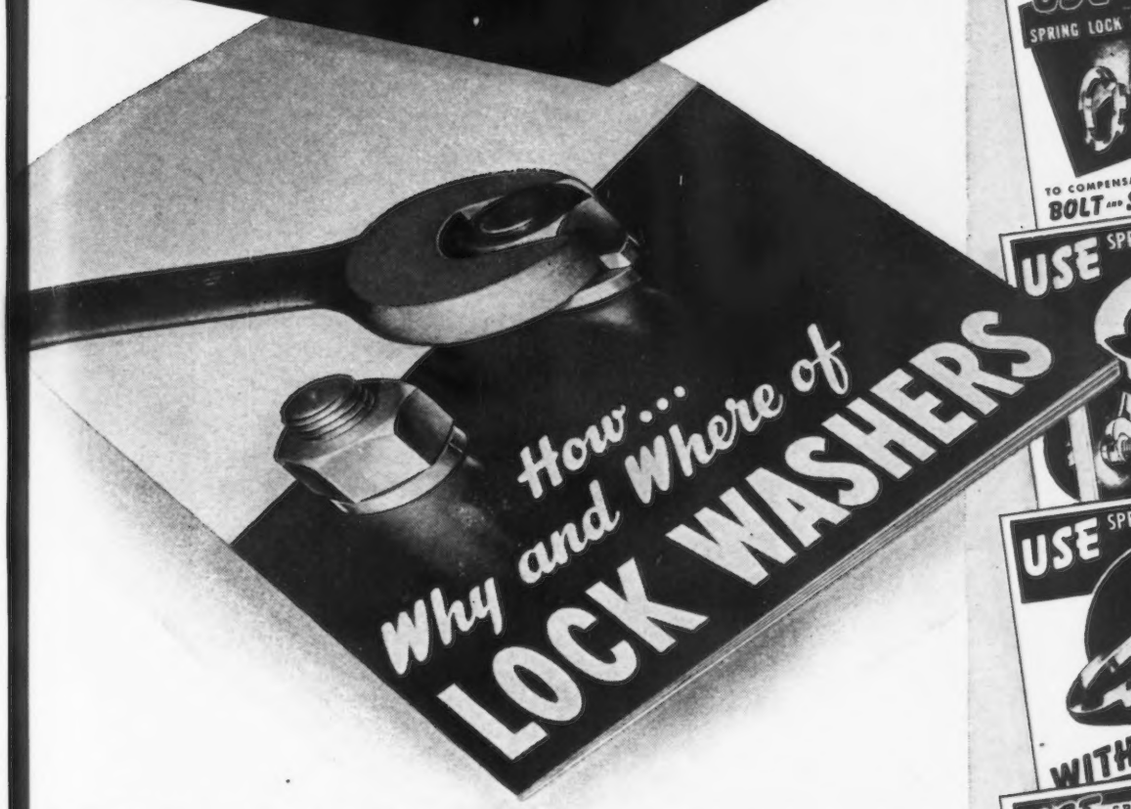

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Washington . . .

L. W. MOFFETT

• Labor trouble still a big problem. Administration caught between two fires on plant seizures . . . Tariff reduction list still not available.

WASHINGTON — The government's labor headaches show little signs of abating; on the contrary, they may grow worse. The recent Court of Appeals action in upholding a decision of a District Court in dismissing the J&L petition to set aside the government's agreement with its mine foremen is viewed in many quarters as giving impetus to what appears to be an organized movement to force government intervention and seizure of all strike-bound plants.

Motive for such a movement is clear. Based on past records, establishment of government seizure as a standard practice rather than as an exception would tend to get for labor much more favorable contracts than could ordinarily be obtained through direct negotiation with the operators—as was amply demonstrated in seizure of the coal mines. Unless the owners meet the contract made by the government, return to private operation would be to invite another strike.

Decision of the White House not to seize the strike-bound farm machinery plants has aroused speculation as to whether this may be regarded as a straw-in-the-wind on future policy. Some believe that it does. They hold that it constitutes a warning to labor that the administration feels it has gone far enough in its labor appeasement policy, that it is abandoning its wartime practice of seizure to end strikes.

SEIZURE of the Case and Allis-Chalmers plants had openly been urged by the CIO, obviously to gain advantages similar to those obtained by the miners—contracts which, presumably, the operators would have to meet in order to regain control of their plants. Apparently, the CIO had counted heavily on farm machinery shortages to swing the balance in favor of seizure. But the White House, in view of current heavy food production, seems to have felt that the strikes did not affect public welfare directly or sufficiently enough to justify the government's latching onto another bear and—like the hunter—finding out too late that it cannot let go.

Thus, interest centers on the present government effort to let loose the coal mine "bear." After three months of government operation, during which neither labor nor management moved to resume formal negotiations, Admiral Ben Moreell has had more than enough of the job of Coal Administrator. Running the mining industry is vastly different from running a ship and the Admiral prefers a ship.

In face of Admiral Moreell's request, which is, in effect, a command, there was little doubt that negotiations would be resumed this month. Both sides were willing. But this is no assurance of a speedy agreement; rather, there is a definite impression here that the first meeting will be merely the prelude to long, protracted negotiations extending far into the fall, perhaps winter.

This opinion is bolstered by Admiral Moreell's virtual ultimatum that return of the mines to the owners will "require an assurance of uninterrupted production," that is, a contract agreeable to both labor and management. General opinion is that labor will not accept a contract which does not embody the same conditions of the one granted by the government—and perhaps more.

OPERATORS have protested that operating costs under the government contract are too high; some have indicated that it is preferable to let the government operate the mines and later try through the courts to recover losses. Some, too, would like to have the question of organization of foremen settled first, since this is a sore point in the negotiations.

The Coal Administrator already has directed filing of charges with the NLRB that J&L is not complying with the contract to negotiate with its supervisory employees. This action paves the way for the whole issue to be laid before the Supreme Court. Several months may elapse, however, before the high tribunal hands down its decision.

Meanwhile, further attention has been attracted to the government and its labor problems by the retirement of Gerard D. Reilly from the NLRB after five years of service during which he became known as the "Great Dissenter." Throughout his term of office he constantly decried the lop-sided situation which prevented management having equal voice with labor.

In departing the Board for resumption of his private law practice, Mr. Reilly delivered several parting shots in the form of recommendations for changes in the Wagner Act in the interest of better labor-management balance and industrial peace.

CHIEF among these were that employers should be provided the right to petition for bargaining selections where a union claims bargaining rights and threatens to strike without resorting to Board procedure; that employers be accorded equal speaking privileges with labor during union organization campaigns; that Wagner Act protection should be denied unions which strike for objectives contrary to the Act; that NLRB should have authority to cope with secondary boycotts; and, last, but

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not the least important, that the prosecuting and enforcement functions should be divorced from the NLRB and transferred to the Labor Dept., leaving the Board a fact-finding and judicial body.

At first glance, appointment of James J. Reynolds, Jr., as successor to Mr. Reilly might appear to be providing the NLRB with a new complexion. Paul M. Herzog is a lawyer (as was Mr. Reilly) but John M. Houston, the second member, is a former lumberman. Reynolds gave up a Stock Exchange seat to enter industry the hard way, first as a day laborer in a foundry, rising to the post of industrial relations director with U. S. Pipe & Foundry at Bessemer, and serving in the same capacity while special assistant to the Under Secretary of the Navy during the war.

A new background, however, does not necessarily mean any deviation in Board procedures. To begin with, major changes in policy must be brought about by Congressional action. To clinch the matter, despite his business background, Mr. Houston is considered by some as the most pro-labor member of the Board and nearly always is to be found voting with Chairman Herzog, a former chairman of the New York State Labor Relations Board.

* * *

CHAIRMAN Lynn R. Edminster of the Committee on Reciprocity Information, replying recently to a letter from Representative Thomas A. Jenkins, R., Ohio, said that much work remains to be done by the Tariff Commission in preparing a list of commodities on which tariff reductions and the "removal of many other kinds of barriers to trade" will be considered at a forthcoming world trade conference.

Mr. Jenkins had asked for such a list which, he said, would involve at least 3000 commodities manufactured in the United States.

Mr. Edminster said that last December, the Secretary of State urged the calling of a world trade conference to consider proposals for expansion of world trade and employment and the establishment of an international trade organization to take its place in the structure of the United Nations alongside of the Bretton Woods Organization and other economic agencies which might be created by the United Nations organization.

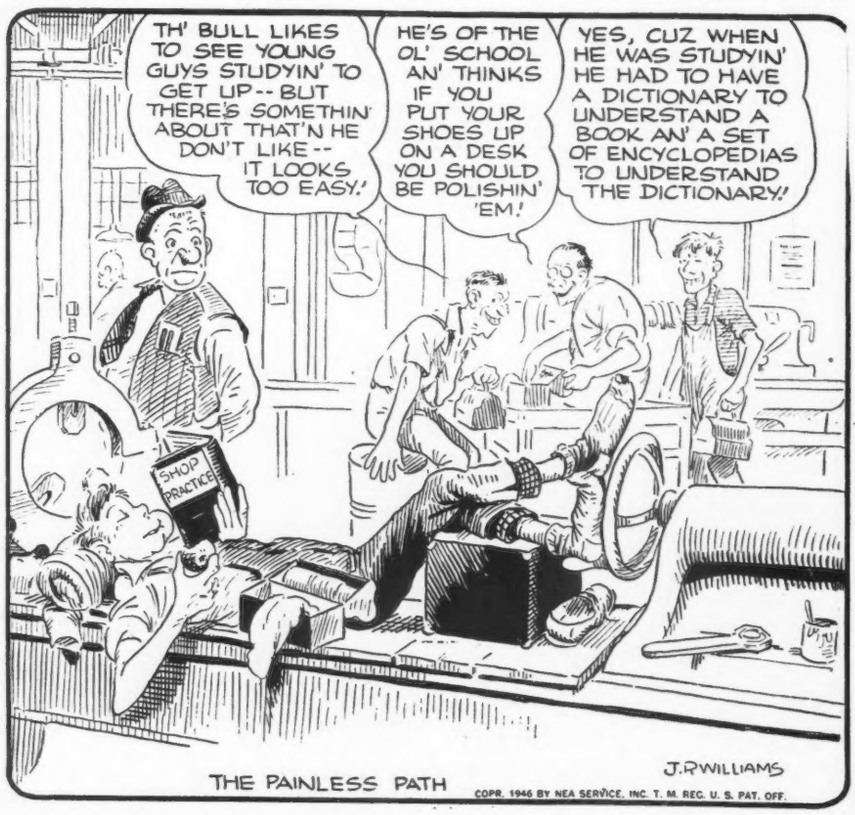
The Economic and Social Council of the United Nations, at the suggestion of this government, Mr. Edminster pointed out, has approved the calling of a trade conference and has appointed a preparatory committee of 19 nations to prepare an agenda for the Trade Conference and develop a draft charter for the proposed trade organization. The Economic and Social Council has called a meeting of this preparatory committee for Oct. 15, at which time views will be exchanged about the project for the world trade conference and the international trade organization and at which plans for future meetings will be made.

THE United States, Representative Jenkins was told, has invited 15 other nations to negotiate trade agreements with it and with each other for the reduction of tariffs and other trade barriers. These negotiations will be held subsequent to the Oct. 15 meeting. No tariff concessions will be discussed at the October meeting.

"I am not unmindful of what you say in your letter regarding the feeling of apprehension which exists among various American industries by reason of uncertainty concerning the publication and contents of this commodity list," Mr. Edminster said. "I should like to emphasize, however, that, after the announcement of negotiations has been made and the list of commodities to be considered has been published and given the widest possible dissemination, every opportunity will be accorded interested parties to prepare and present their case.

"Adequate time will be allowed for preparation of briefs; public hearings will be held as required by law; and the trade-agreements organization will carefully analyze and digest the testimony and collate it with other information available to it before arriving at a decision with respect to any product. No decision or commitment will be made with respect to any item until this process for obtaining and giving full consideration to the facts and views submitted by interested parties has been completed."

THE BULL OF THE WOODS — BY J. R. WILLIAMS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HE'S OF THE OL' SCHOOL AN' THINKS IF YOU PUT YOUR SHOES UP ON A DESK YOU SHOULD BE POLISHIN' 'EM.'
YES, CUZ WHEN HE WAS STUDYIN' HE HAD TO HAVE A DICTIONARY TO UNDERSTAND A BOOK AN' A SET OF ENCYCLOPEDIAS TO UNDERSTAND THE DICTIONARY.'
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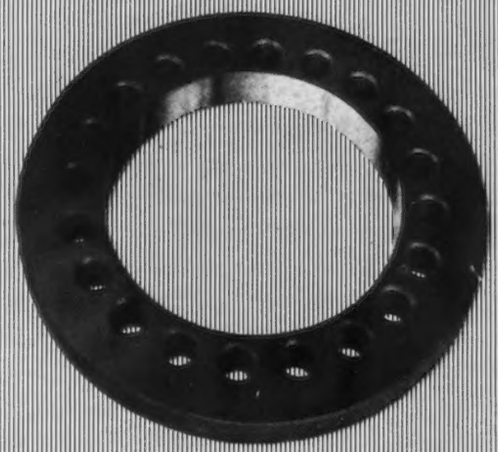

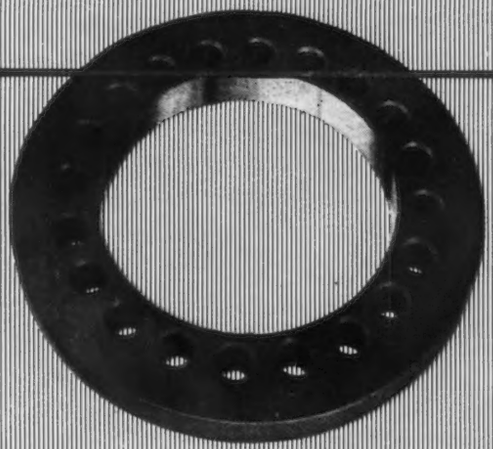

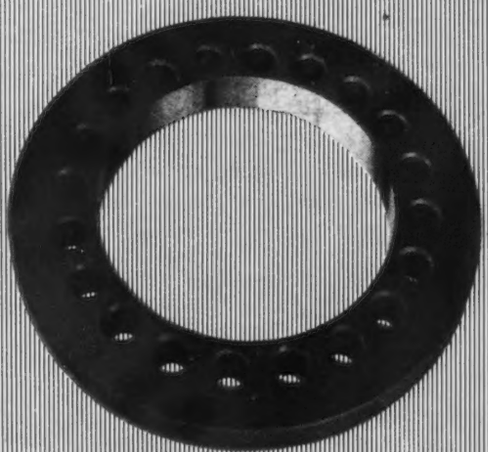

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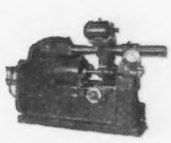

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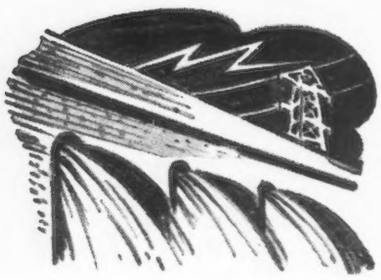
West Coast . . .

ROBERT T. REINHARDT

• Management and labor in San Francisco organize group to bring more steel sheets to Pacific Coast . . . CPA accused of discriminatory distribution of admittedly inadequate national supply.



SAN FRANCISCO — Management and labor have found a common interest in this area —attempting to get more sheet steel to keep fabricators in business and make possible the completion of thousands of homes which need gutters, downspouts, ducts and other sheet metal components.

R. D. Cortelyou, representing steel warehouse distributors of northern California; Fred Green, president of the Sheet Metal Contractors' Assn.; Thomas White, of the AFL Warehouse Union; and Jack Smith of the AFL Building Trades Council have launched a campaign to increase allocations of sheet steel to this area. At a meeting last week the group was assured of the support of congressman Franck R. Havenner, fourth district, who proposed to secure the backing of the entire California congressional delegation.

The shortage of steel sheets of all grades is nothing new to the area, but the situation is now acute because the few mills still in this market have reported to customers that they have little or nothing to offer to anyone without preference ratings for the balance of this year and that the outlook for the first quarter of 1947 is no better. Galvanized stock is particularly tight and is said to be the bottleneck in the completion of many homes.

Impending shutdown of the Pittsburg, Calif., hot mill of Columbia Steel Co., scheduled for early next year while the new cold rolling facilities are installed, is another cloud on the horizon which is worrying fabricators. It has been rumored that the close-down would stop production for as long as six months, but Columbia officials insist that unless some unforeseen difficulties such as labor troubles or failure of deliveries of equipment as promised develop, the mills will be down less than three months. However, it is conceded that in the present tight situation, even this loss of production estimated at approximately 20,000 tons of sheets of all grades is important. Production of sheets at the Torrance, Calif., plant of Columbia is scheduled to continue at its capacity rate of approximately 90,000 tons per year.

PRINCIPAL responsibility for the extreme shortage here is placed on the heads of the Civilian Production Administration in Washington and its preference rating system. Criticism is leveled at the CPA for the ambiguity of some of its regulations which, it is contended. leave the door wide open for mills to favor particular customers or sections of the country, and the fact that important directives reach the West Coast too near deadlines for filing requests for preference ratings.

According to the labor management committee seeking relief, warehouses out here are getting less than one-tenth of 1 pct of the sheet tonnage they received during prewar years. Mill buyers who qualify for preference ratings state that they are getting only 5 to 50 pct as much tonnage as they request from CPA. Particularly irksome is the extensive assignment of MM ratings to suppliers of this area. One situation in which a local mill was directed to supply a large part of its sheet production under an MM rating to the manufacturer of paint cans for the Army has been cited as particularly discriminatory.

Even though the entire sheet fabrication industry is involved, the shortage of sheets for home construction has taken the center of interest because of the tremendous public concern in this activity. It is pointed out that while approximately 20 pct of the home building of the nation is located on the Pacific Coast, there has been no recognition of this condition by CPA in making allotments.

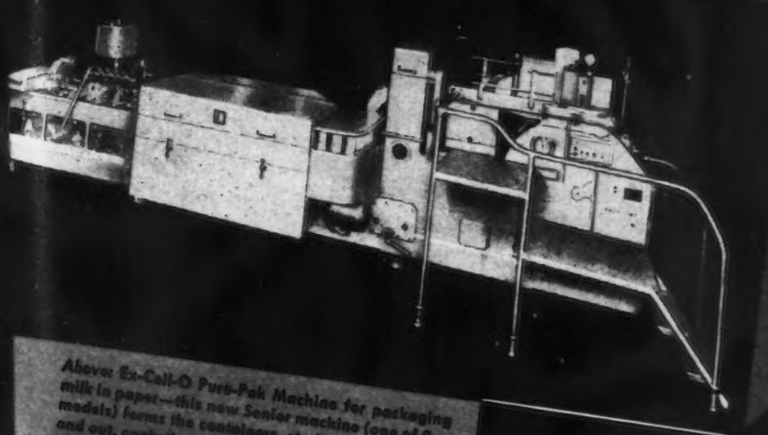
OFFICIALS of the building trades estimate that approximately 5000 men are threatened with idleness in metalworking shops alone in the San Francisco Bay area unless considerable relief is afforded by diverting more steel from the East to this section. It is generally admitted that the local condition is no worse that that which prevails in other Coast communities, and it is hoped that a solid western front of labor and management will be organized to bring about improvement.

Those most familiar with the national sheet supply picture admit that in attempting to get more material for this section they are trying to squeeze blood from the turnip, but they contend that what little blood there is should be more equitably distributed.

Mill representatives here are quite frank to admit that so far as they can see now, conditions will get worse before they get better. The fourth quarter of this year seems a total loss so far as improvement is concerned, they say, and only in the latter part of the second quarter next year can additional sheets be expected out here. This slight bit of optimism is based largely on the expectation that the $190 million expansion of Bethlehem Steel Co. at Sparrows Point, Md., will get into operation in February or March. This facility was expected to be producing in the last quarter of this year but lack of equipment has delayed completion.

The strip mill of Kaiser Co., Inc. at Fontana, Calif., will also afford some relief in the narrow widths

DIVERSIFIED ?



XLO

EX-CELL-O *for* PRECISION

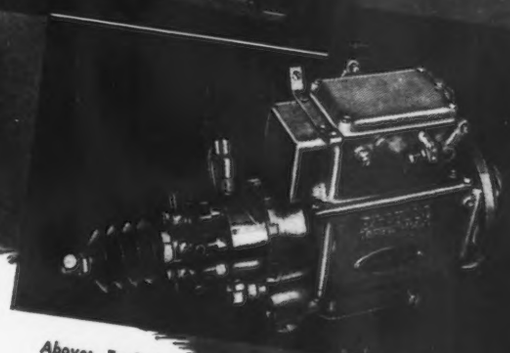
Above: Ex-Cell-O Pure-Pak Machine for packaging milk in paper—this new Senior machine (one of five models) forms the containers, sterilizes them inside and out, coats them, fills, seals and dates them—all in one continuous, automatic operation in the dairy. Pure-Pak containers for dairy products are now being used at the rate of more than one billion containers a year.

To Right: Ex-Cell-O engineering services and precision machines are helping speed up many American industries for the production of accurately-made parts and assemblies. Shown here is Ex-Cell-O special machine for boring, reaming 18 holes and drilling 36 holes in a magnesium crankcase.

. . . the pioneering spirit of Ex-Cell-O remains undaunted

. . . an opportunity to reaffirm our company's allegiance to the pioneering spirit that brought it into existence. It is a spirit that maintained Ex-Cell-O unfailingly during the economic extremes of the twenties and the thirties, and that enabled the company, during the early forties, to make a worthwhile contribution to our nation's war effort. I can say in all sincerity that the same spirit impels the whole Ex-Cell-O organization of today . . . a clear assurance of the active role that Ex-Cell-O will play in the peacetime years immediately ahead.*

**from a message by Phil Huber, President and General Manager of Ex-Cell-O Corporation, on the occasion of the company's 25th Anniversary . . . as timely and significant now as when given in 1944.*



Above: Ex-Cell-O [illegible] Pumps—for high speed [illegible] gines in the automotive and industrial fields.

To Right: Ex-Cell-O [illegible] jection System for aircraft —the advantages of gas injection make flying safer, easier and more economical and enjoyable.

EX-CELL-O

CORPORATION • DETROIT

Manufacturers of Pure-Pak Paper Milk Bottle Machines, Aircraft and Miscellaneous Production Parts, Precision Machine Tools and Equipment, Continental Cutting Tools, Fuel Injection Equipment, Railroad Detail, and Drill Jig Bushings.

when it starts to roll about June producing 16 in. and 18 in. strip at the rate of 20,000 ton per year.

WHILE the long range-sheet supply for the Coast looks promising, the immediate prospects are anything but good. The local committee believes its best hope lies in convincing CPA that something must be done to rectify what it considers discriminatory distribution and that if officials of that bureau can't be made to see the light, then organized political pressure must be brought to bear. It is pointed out that under the emergency powers still retained by the executive branch of the government it is possible to establish directives which would force mills to sell their products in the West even though markets nearer their plants were more inviting.

Added to the list of steel shortages affecting the housing program is small diameter steel pipe. The Pacific Gas & Electric Co. which supplies these utilities to a large section of northern California has been informed that promised and scheduled shipments of ¾ in. gas pipe can't be made. It is reported that hundreds of homes are ready for occupancy except for the lack of gas connections.

In an appeal to the CPA for more favorable allocations to this area, R. D. Cortelyou has written to John D. Small, administrator:

"Announcement by the Columbia Steel Co. of San Francisco to the effect that by virtue of its receipt of orders bearing AAA ratings, for delivery of sheet steel products in the fourth quarter of this year to the extent of its capacity, has further aggravated an already critical situation in the supply of these products on the Pacific Coast. Warehouse distributors have been advised that they can expect no tonnage from this source during the fourth quarter.

"While it is fully realized that a shortage of sheet steel products is a general condition throughout the country as a whole, a series of circumstances has placed the West Coast in a less favorable position than elsewhere in the nation. Prior to and during the war this area was supplied in large part by mills located in eastern and middle western areas. For reasons best known to those mills they have, since the end of the war, withdrawn from the Coast market and, with the exception of the completion of a few old committments, no sheet steel products are being received from such sources . . ."

"THE importance of warehouse stocks cannot be overemphasized. Literally thousands of smaller manufacturers and fabricators depend upon the warehouse distributor for their requirements. While the term 'smaller' has been used here they are, however, of prime importance in the production of many items essential to the public welfare. These are too numerous and of varied uses to mention but would include such items as down-spouts, eavestroughs, furnaces and furnace fittings, flashings, ventilators, and other items used in home construction. In addition much necessary equipment for agricultural purposes is produced by these manufacturers and fabricators.

"Many large industrial plants as well as all of the public utilities depend upon the warehouse for materials needed in the repair and maintenance of their equipment.

"Rather than further elaborate upon the dire effects which would result from the existing and threatened future situation, we feel that it is imperative to urge that practical and positive steps be taken, now, toward its correction.

"We urgently request that the first of these be to place directives upon producers in eastern and middle western areas to reserve some proportion of their output of sheet steel products, in sizes and types most needed in this area, to supply, at least, minimum requirements of the Steel Warehouse Distributors of the Pacific Coast. Proper proportions and allotments could probably best be determined by a survey of past records of both the producers and warehouses. Very complete records of the movement of these products were maintained by the Steel Warehouse Branch of the War Production Board and may still be available.

"We do wish to stress, however, regardless of the method employed in its accomplishment, that some positive action must be taken, now, to make available to this Coast a sufficient quantity of sheet steel products to supply its minimum requirements and prevent actual hardship."

CORRECTION: The statement that West Coast warehouses are getting less than one-tenth of 1 pct of their prewar sheet tonnage, appearing in paragraph 6 on p. 80, is in error. It should read, "One-tenth of prewar sheet tonnage."

Twenty-One Industrial Plants to Be Allocated Among Allied Nations

Washington

• • • A list of 21 industrial plants will be considered for allocation among member nations of the Inter-Allied Reparation Agency at Brussels in the near future.

The forthcoming action on these plants follows the allocation in July of 11 German plants to western nations, none of which were allocated to the United States. No official announcement has been made with respect to prices or terms.

Types of plants awaiting allocation by the IARA and their locations are as follows: Oberursel (machinery); Herborn (optics); Bremen (armaments); Esslingon-Neckar (machinery); Bavaria (armaments); Strass (armaments); Deschnig (armaments); Geretsried-Wolfratshausen (armaments); Wuppertal-Ronsdorf (chemicals); Soltau (armaments); Scheuen (armaments); Lehre (armaments); Bodenteich (armaments); Clauen (armaments); Hamburg-Bergedorf (machinery); Luebeck (aircraft); Ahrbergen (armaments); Lockstedten-Lager (armaments); Bavaria (aircraft engine plant); Allach, near Munich (aircraft engine plant); and, Bavaria (hydro-electric power plant).

Industrial firms interested in acquiring any of these plants for operation or transfer, in the event they should be allocated to the United States, are requested to write the Reparation Staff, Office of International Trade, Commerce Dept., Washington, not later than Sept. 10. Such inquiries do not constitute any commitment, OIT pointed out.

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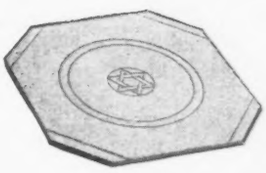

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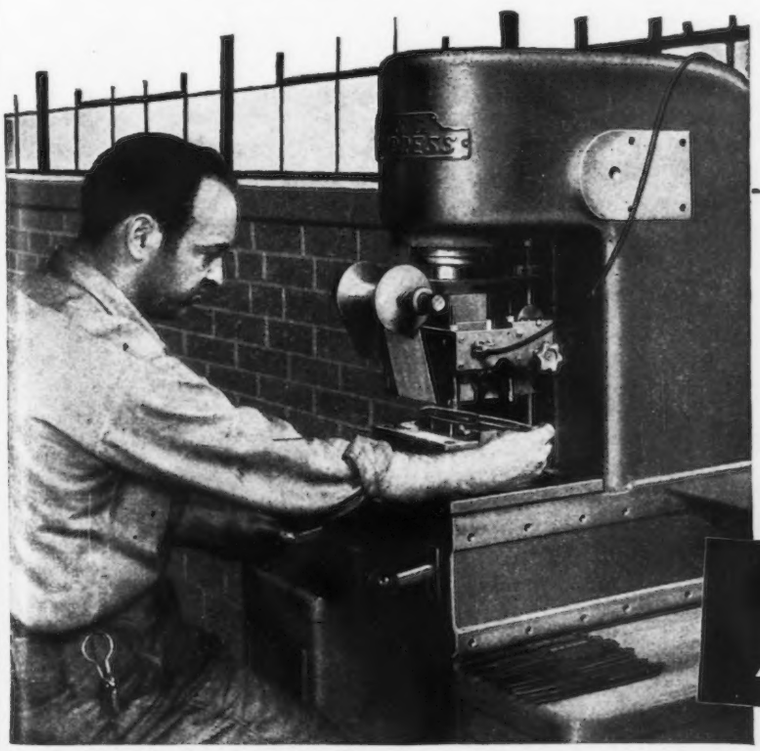

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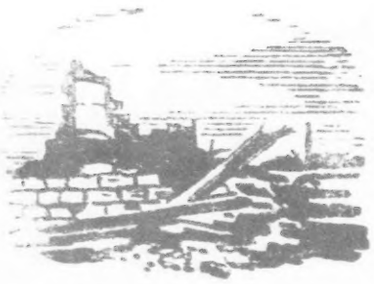
European Letter . . . JACK R. HIGHT

• Current French and British opinion on allocation of Ruhr coal exports differ sharply . . . North German Coal Control faces difficult task in view of desolation of area and German complaints.



ESSEN, GERMANY — French and British views on coal allocations differ sharply— Perhaps the widest divergence of viewpoints that is possible exists between current French and British opinions on the correct allocations of Ruhr coal exports. The problem has been simmering for months, and promises to come to a head in the near future, as British officials in the Ruhr are now proposing that all coal exports from the Ruhr be halted for a period of six months, while French authorities are pressing for a bigger share of shipments.

Despite an overall desire on the part of the French and British Governments to operate in harmony on all such questions, there is today considerable bitter acrimony among those officials actually conducting the work. The basic issues in the struggle are simple to define, and have been mentioned by this writer in previous articles (see THE IRON AGE, May 23, 1946, p. 84, and July 4, 1946, p. 94).

Although France has important coal mines of its own, and with the help of prisoner of war labor has increased French domestic coal output to above 1938 levels, French heavy industry has always depended upon the Ruhr for imports of high grade coal. The French opinion is that allocations from the Ruhr should permit the operation of French steel mills before the Ruhr gets much coal for its own industrial reconstruction. This position is simple and understandable.

On the other hand here in the headquarters of the British North German Coal Control the administrators consider the French demands to be outrageous. The local British position, and the local position has prevailed in London official circles thus far, is that the German mines are so badly in need of machinery, and the miners need consumer goods so badly as an incentive to work, that increased coal must be made available in the Ruhr itself, and consequently less rather than more will be available for export.

This position, which if followed through to the ultimate might possibly see a strong revival of the entire industrial activities of the Ruhr if the goal of making consumer goods available is pursued, seems strange in the light of the demands of other nations, but is understandable in the light of the local position.

Despite the existence of an international European Coal Organization, there is a serious gap in the machinery of making the allocations. The sphere of the ECO is to make the necessary allocations of Ruhr coal, after the Allied Control Council in Berlin states how much will be available in any given period. In these allocation meetings the French and other European countries have an opportunity to present their respective cases, and they have been receiving some consideration.

In Germany, however, the North German Coal Control from its headquarters here in a palatial mansion which formerly belonged to Krupp does most of the deciding as to the all important question of availability of coal for export, the figure upon which the ECO must depend.

In this position, the North German Coal Control is in an extremely subjective position. Living in Essen, they are surrounded by the most disheartening mile after mile of war produced rubble. Their daily contacts are about as follows: (1) Among themselves, including the people who are fighting to raise coal production in the face of myriad difficulties. (2) Among the military government officials who must try to do as good a job as possible of running Germany, and are trying conscientiously to do so. (3) Among the Germans in whose midst they live, and whose complaints are mostly uttered in half-moans. Germans are able whiners.

This life in Essen, mastering the German coal industry, is an introverted, insular existence (as most occupation jobs are). In the face of these circumstances, it is only natural that the British administrators here should be all out for reconstructing the Ruhr within the limits of the Potsdam agreement and the level of industry plan, that is to a 5.8 million ton annual steel production, and at the same time anxious to get the annoying Frenchmen out of their hair.

If the North German Coal Control were located in a devastated French city, perhaps in Caen, or in Rotterdam, and the staff had been living among the people of those cities for a year instead of here in Essen, there would be no question of halting coal exports from the Ruhr today.

FROM the above it would seem that the people here in Essen were actually determining how much of the Ruhr production goes into railway cars for export, and Essen officials will hasten to explain that the system was established somewhat differently. Actually the plan is that the Four-Power control council in Berlin should decide how much coal is going to be used in Germany, and how much is available for export. But Four-Power agreements on coal questions are as rare as on other subjects, and it seems probable that in default of Four-Power agreement, the British proceed in their own zone in following policies they deem wise, as does every other occupying power in the respective zones.

Thus, for whatever reason, we find that although nominally they do not control the allocations of Ruhr coal, the staff here is against further exports, and that policy seems likely to prevail. The chain of command in between is a little obscure, but the result is the same.

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And from an outsider's viewpoint it seems likely that in the future there will continue to be less coal available for export, although the requested moratorium seems out of the question.

There appears to be a structural gap in the allocation question which is not being filled at present by any authority. It would seem proper that some international organization, be it the ECO or whatever, should be considering all aspects of the coal situation, and be in a position to decide which of the war devastated countries should be assisted with maximum coal supplies first. There is as yet no decision as to whether Germany should be at the front or rear of the coal queue.

While they are making a constant struggle to get as much coal as possible from the Ruhr, the British authorities are probably doing at least a certain amount of capable juggling of their internal coal allocations to make their statistical plight appear as serious as possible. Due to the reluctance of French officials to release detailed statistical information to the press, a complete analysis of coal allocations is almost impossible, but from the figures at present available it is evident that the French steel industry is not getting its prewar share of the coal imports presently arriving from the Ruhr.

While this struggle is going on, operating administrators here continue their efforts to get coal production on as high a level as possible. Following the sharp drop in output when food rations were cut in March, production has risen gradually until it has about regained first quarter levels. There are several plans being developed to start a flow of consumer goods to the miners, as there is no incentive of any kind to encourage diligence.

The present work force in the mines totals about 269,000 miners, and present recruiting-drafting programs are just about holding that level, with a weekly wastage of about 1500. Officials here would like a work force of about 310,000, but see no prospect of getting the additions in the near future. Approximately 12,000 Sudetenland miners are scheduled to be shipped to the Ruhr mines, but there is a serious problem in finding anything for them and their families to live in. All the cellars, attics, and shelters that remain in the Ruhr are already full.

There is considerable talk of recruiting miners in the American zone, but so far American authorities have balked on any kind of a compulsory plan, and the British are pessimistic about the worth of a voluntary plan, as no miner wants to move out of the American zone into the Ruhr unless he is out of his mind. American officials have offered as an alternative a plan whereby the recruitment would be compulsory, but for a limited period. That is, men would have to go for 2 yr. This plan may be adopted, but it will have to wait until the British can put a limitation on the period of servitude for the men serving from their zone. At present such a limit is not possible, as there are no available replacement miners.

Coal allocations from the Ruhr mines for a single month recently were as follows:

	Pct
British zone (Germany)	34
Export	20
American zone	8.5
French zone	2.4
Russian zone	2.5
British zone railways	8.5
American zone railways	5.5
French zone railways	1.0
British zone port operations	1.2
U. S. zone port operations	0.5
British zone inland waterways	0.7
U. S. zone inland waterways	0.3
Military troops, British zone	1.5
Military troops, U. S. zone	1.0
Military troops, French zone	0.7
Berlin occupation troops	0.38
Austrian occupation	4.4

Thus the British zone of Germany was using 45.9 pct of the Ruhr production, the American zone 15.5 pct, and the French zone 4.1 pct.

British Say Aluminum Sales Involve Loss

London

• • • **The British Committee** of Public Accounts reports that sales of aluminum by the Ministry of Supply have involved a loss to the British Treasury. The selling price of $302.60 per net ton was less than the cost to the Ministry of stocks purchased in earlier arrangements and of that portion of current supplies purchased from British sources. Since the controlled selling price was further reduced last April to $238.52, the loss has since been increased.

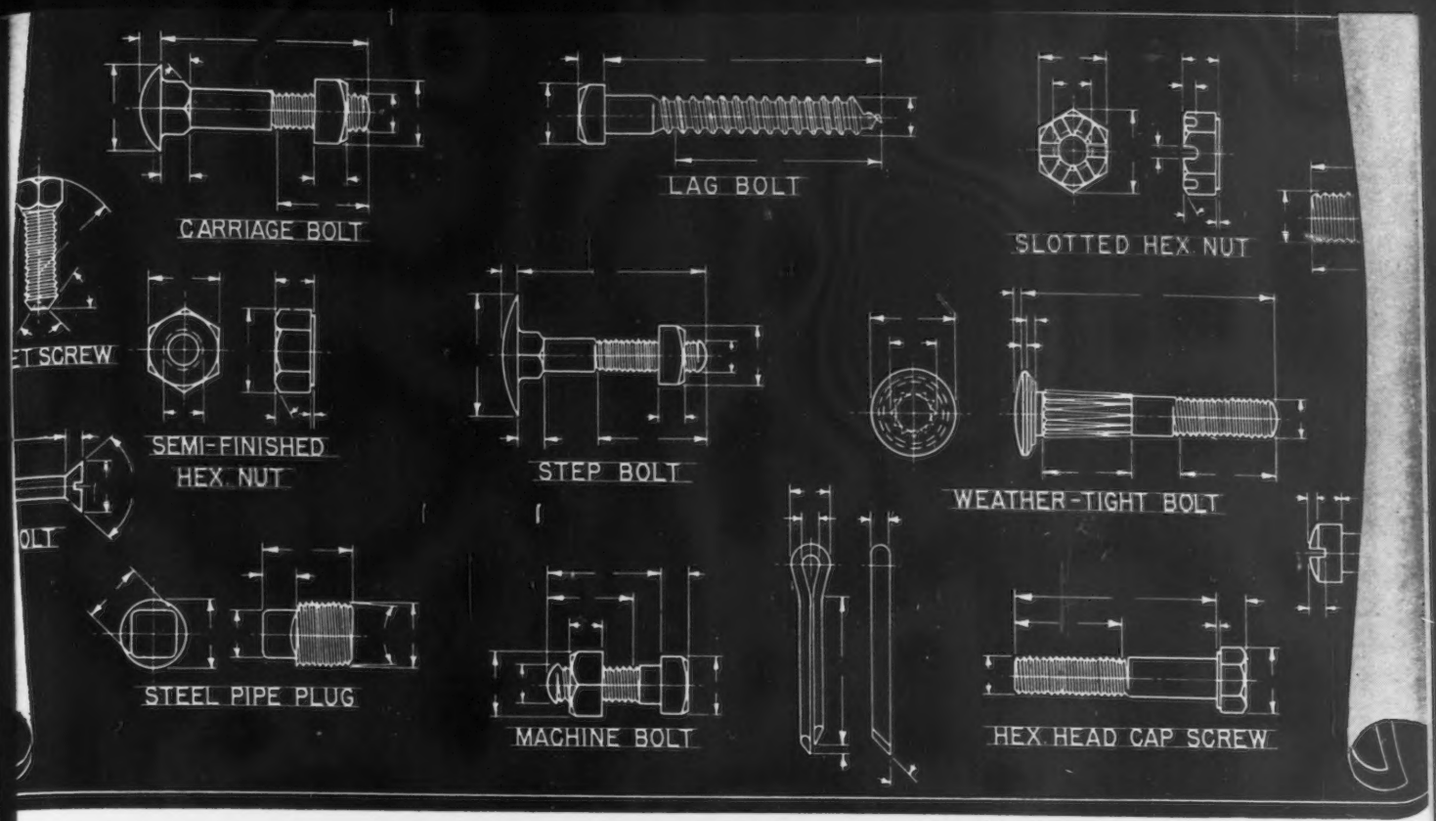
The Ministry has explained to the committee that the war came to an end with very large stocks of aluminum accumulated in Britain and the world generally. The price at which new aluminum could be bought was falling, and the Ministry considered it to be more advantageous to proceed with an orderly liquidation of surplus stocks early rather than to retain them with the chance of making a larger loss later on.

The price at which they were selling was not below that at which aluminum was being imported, but it was considerably below the price they were paying for home produced aluminum.

o o o

TOM THUMB BUS: *London raised a few eyebrows when a chap from Rugby put his baby bus on a train to London and there drove it, using pedal power in lieu of petrol, down Piccadilly.*

o o o



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PERSONALS

° ° °

• **John A. Sargent** has been elected treasurer of the Diamond Alkali Co., Pittsburgh. He had been identified with the Campbell Metal Window Corp., a subsidiary of American Radiator & Standard Sanitary Corp., as vice-president and general sales manager, and continued these responsibilities with the Truscon Steel Co., a subsidiary of the Republic Steel Corp., until his enlistment in the Army Service Forces in 1942.

• **R. I. Wohlforth** has been appointed assistant superintendent of the mechanical dept. at Indiana Harbor works of the Youngstown Sheet & Tube Co.

• **E. R. Gilmore** has been appointed chief engineer of the Pittsburgh Equitable Meter Div. of Rockwell Mfg. Co. He joined the company in 1936.

• **Douglas L. Darnell** has been elected vice-president in charge of sales of the Baker-Raulang Co., Cleveland. He joined the company's sales staff immediately following World War I and became sales manager in 1936.

DOUGLAS L. DARNELL, vice-president in charge of sales, Baker-Raulang Co.

• **Howard F. Doll** has been named vice-president in charge of engineering at Victor Electric Products, Inc., Cincinnati. Mr. Doll joined the organization in 1945 as chief engineer. **Clifford Rehse** has been appointed vice-president in charge of purchasing. He has been with the company for 15 yr and has been purchasing agent since 1931.

• **David W. Lee** has been named assistant truck sales manager of the Ford Motor Co., Dearborn, Mich. He worked with Chrysler from 1935 to 1937 and was promoted to sales engineer of the Dodge Truck Div. He recently managed the sales engineering and sales promotion depts. of Chrysler's Fleet Sales Div.

• **D. A. Nabb** has been appointed assistant sales manager of the Detroit Seamless Steel Tubes Co., Detroit. Mr. Nabb has been associated with the company since November 1945.

• **Richard F. Muller** has been named manager of the New Orleans district office of the Allis-Chalmers Mfg. Co., succeeding F. W. Stevens. Mr. Muller, who was promoted to assistant manager of this office early in 1946, joined Allis-Chalmers in 1920.

• **Quentin D. Mehrkam** is now a metallurgist in the experimental dept. of the Ajax Electric Co., Philadelphia. He was formerly associated with Thompson Aircraft Products Co., Cleveland.

• **F. D. Smith** has been appointed assistant to the general manager of sales of Oil Well Supply Co., U. S. Steel Corp. subsidiary, at the company's headquarters in Dallas. **C. M. Wittum** has been made eastern division credit manager with offices in Columbus, Ohio, and **John E. Miller** is the new machinery service manager of the general sales dept., Dallas. Mr. Smith has been associated with Oil Well for 18 yr. He represented the company in Kentucky, Pennsylvania and Michigan prior to becoming eastern division manager in 1941. Mr. Wittum has been with the company for 12 yr and was previously district credit manager at Columbus. Mr. Miller began his company career as a student engineer in 1933, later serving in Kansas, Wyoming and Canada.

ASTOR L. THURMAN, assistant to vice-president, Aetna-Standard Engineering Co.

• **Astor L. Thurman** has been appointed assistant to the vice-president, Aetna-Standard Engineering Co., Youngstown, Ohio. He has been chief electrical engineer since December 1945 and was previously with General Electric Co., Schenectady, for 8½ yr. **James Riddell,** formerly assistant chief electrical engineer, succeeds Mr. Thurman as chief electrical engineer. Before coming to Aetna-Standard 8 yr ago he was with the Great Lakes Steel Corp. and Republic Steel Corp.

• **Russell L. White** has been elected a member of the board of directors of the Marmon-Herrington Co., Inc., Indianapolis. Mr. White is president of the Indiana National Bank, and of the White Baking Co.

• **T. A. Peebles,** vice-president in charge of engineering, Hagan Corp., Pittsburgh, has retired after 30 yr active service with the company he helped to found. While retiring from active service, Mr. Peebles will retain financial interests in the corporation and also serve as engineering consultant.

• **John S. Muller,** manager of the Power Transmission Div. of American Pulley Co., Philadelphia, has resigned to take the position of sales manager of Shingle & Gibb Co., Philadelphia.

• **C. B. Cushwa, Jr.**, vice-president and secretary of Commercial Shearing & Stamping Co., Youngstown, Ohio, will become president of Kelly Steel Works, Inc., Chicago, recently purchased by Commercial Shearing. He will retain his connection with Commercial, while succeeding William J. Kelly, former president of the Chicago firm.

• **H. Ward Lewis** has been appointed Pittsburgh Limestone Corp.'s supervisor of operations, with headquarters at New Castle, Pa. **Clifton A. Pratt** has been named superintendent of this U. S. Steel subsidiary's Kaylor Limestone Mine in Armstrong County, succeeding Mr. Lewis. Mr. Lewis has been with the company since 1920 as engineer, assistant superintendent and superintendent. Mr. Pratt joined Pittsburgh Limestone in 1939 as a plant mining engineer.

• **I. B. Anderson** has been appointed manager of the Stainless Steel Div. of Jessop Steel Co., Washington, Pa. Mr. Anderson has been associated with the steel industry for 24 yr. He was employed by the American Sheet & Tin Plate Co. of the U. S. Steel Corp. until 1932, then accepted a position at the Wood Works of the Carnegie-Illinois Steel Corp. He transferred to the general offices of the corporation's Stainless Steel Div. in 1940, and in 1945 joined the Jessop organization.

I. B. ANDERSON, manager, Stainless Steel Div., Jessop Steel Co.

• **J. L. Onderdonk** has been appointed an assistant vice-president of the American Car & Foundry Co. He will continue to make his headquarters at the Chicago sales office. Mr. Onderdonk has been associated with ACF since 1912.

• **Richard Flury** has been appointed factory manager of the Gemmer Mfg. Co., Detroit. Mr. Flury, formerly chief metallurgist, has been with the Gemmer company for more than a decade. He succeeds **C. S. Horn**, who has resigned.

• **E. Donald Mairs** has been appointed assistant works manager of the Fabricating Div. at the Massena, N. Y. works of the Aluminum Co. of America. He has been employed by the company for the past 10 yr.

• **Walter J. Johnson** has been named assistant treasurer of Nichols Wire & Steel Co., Davenport, Iowa. He was formerly in charge of the export financial dept. of the Bethlehem Steel Co.

• **C. D. Schumacker** has been named executive vice-president of Tyson Bearing Corp., Massillon, Ohio.

• **Albert Bradley**, executive vice-president of General Motors Corp., has been elected to the board of directors of the Ethyl Corp., New York, succeeding **Donaldson Brown**, resigned.

• **John D. Foley**, former superintendent of Remington Arms plant, Bridgeport, Conn., has been appointed works manager of H. O. Canfield Co., Bridgeport.

• **L. M. Hart, Jr.** succeeds L. M. Hart, Sr. as president of White Motor Co. of Canada. Prior to assuming the presidency, Mr. Hart, Jr. was vice-president in charge of sales.

• **Felix Doran, Jr.** has resigned from General Motors Corp., Detroit, to enter the retail motor car distribution field in Dallas, Tex. He has spent 21 yr with the Chevrolet Motor Div.

• **Howard J. Ward** has been named district manager for the Michigan territory by Udylite Corp., Detroit, replacing **William H. Ross**, resigned. Mr. Ward has been associated with Udylite for the past 10 yr.

RAY D. CUNNINGHAM, director of sales, Nox-Rust Chemical Corp.

• **Ray D. Cunningham** has been appointed director of sales of the Nox-Rust Chemical Corp., Chicago. Mr. Cunningham comes to Nox-Rust from the Wolf's Head Oil Refining Co., Oil City, Pa., where he served as general sales manager. During the war he was manager of the rust preventive and protective coating dept. of the Kendall Refining Co. **W. F. Costello, Jr.** has been selected eastern sales manager of the same organization. Mr. Costello formerly was with the Inter-Coastal Paint Corp. as manager of sales and technical services, eastern division.

• **Howard S. Gier** has been made assistant vice-president in charge of the western region of Sharon Steel Corp. with headquarters at Chicago. For the past 16 yr Mr. Gier has been in the Detroit office, and was named district manager of that office in 1939.

• **Emil G. Holmberg** has been appointed consulting metallurgist for Alloy Steel Products Co., Linden, N. J. Mr. Holmberg had been a research metallurgist specializing in corrosion problems at the Belle, W. Va. plant of E. I. du Pont de Nemours & Co. Inc.

• **E. P. J. Rigdon** has been appointed southwestern regional manager of Packard Motor Car Co., Detroit. He has previously served as special representative on dealer organization in western states, as Detroit regional manager and as Dallas zone manager.

• **F. L. Steuber** has been appointed assistant general manager of sales of Central Iron & Steel Co., with headquarters at Harrisburg, Pa. Prior to joining the Central organization in 1945 as Philadelphia district sales manager, Mr. Steuber had been with Heat Transfer Products, Inc., New York, and had previously been with Carnegie-Illinois Steel Corp. in Philadelphia for many years.

• **Edward C. Logelin, Jr.** has been appointed director of public relations, U. S. Steel Corp. subsidiaries, Chicago district, succeeding Arthur C. Wilby, who has been elected vice-president, U. S. Steel Corp. of Delaware. Mr. Logelin has been principal assistant to Mr. MacDonald since 1943. He has been associated with U. S. Steel since 1930, when he began in the advertising dept. of Universal Atlas Cement Co. He became assistant to Mr. Wilby, who was then manager of public relations, Chicago district, Carnegie-Illinois Steel Corp. in 1937, and in 1941 was named assistant director of public relations, U. S. Steel Corp. subsidiaries in Chicago.

• **John W. Adelung,** formerly New York and New England regional director, Office of Defense Transportation, has been appointed district manager of Mack-International Motor Truck Corp.'s White Plains, N. Y. branch.

E. J. McGEHEE, sales manager, Koppers Co., Inc.

• **E. J. McGehee** has been named sales manager of Koppers Co., Inc., Pittsburgh. Mr. McGehee, who is a vice-president of the company, in his new capacity will coordinate Koppers sales activities on a companywide basis. He first became associated with the Koppers organization in 1934 and since that time has served in various executive positions. He was appointed a vice-president of the company in 1941. Prior to joining Koppers, Mr. McGehee was a production and sales executive of Ayer & Lord Tie Co., which subsequently was purchased and merged with the Koppers Co.

• **August A. Bolik,** for the past 20 yr district manager of the Dayton and Cincinnati sales offices of E. W. Bliss Co., has resigned to become associated with Henry F. Smith & Son of Cincinnati, in charge of their Dayton office.

• **Moorhead Wright, Jr.** has been appointed to the staff of vice-president L. R. Boulware and assumes new duties in the executive dept. of the General Electric Co. in New York. He will be succeeded as manager of the apparatus dept.'s Employee Information Div. at Schenectady by **D. J. Sullivan.** Mr. Wright joined General Electric in 1927. He became a proposition engineer in the Central Station Divs. and was later transferred to the Boston office as a salesman. In 1938 he became a lighting engineer for the lamp dept.'s New England district and returned to Schenectady in 1942 as supervisor of personnel and administrative activities in the Aeronautics & Marine Engineering Div. Last year he was appointed manager of the apparatus dept.'s Employee Information Div., the position he held until his present promotion. D. J. Sullivan entered GE's business training course in 1934, became a section head in the Disbursement Div. and later a traveling auditor. He joined the publicity dept. in 1940, and worked on transportation advertising. He was inducted into the Army in 1941 and recently rejoined GE and has been associated with the Employee Information Div. which he will head.

...OBITUARY...

• **William M. Barr,** 51, died on Aug. 16. He was assistant general manager of the Barnes-Gibson-Raymond Div. of the Associated Spring Corp., Detroit.

• **Charles H. McCrea,** 56, president and director of the National Malleable & Steel Castings Co., Cleveland, died Aug. 24. He was a district sales manager of National Malleable from 1919 to 1930, when he was made sales manager at Cleveland. From 1937 to 1942 he was works manager of the malleable iron plant there. After a brief term as the company's first vice-president in 1942, he was elected president and director.

• **John J. Killeen,** 55, owner and operator of the Killeen Machine Tool Co., Worcester, Mass., died Aug. 19.

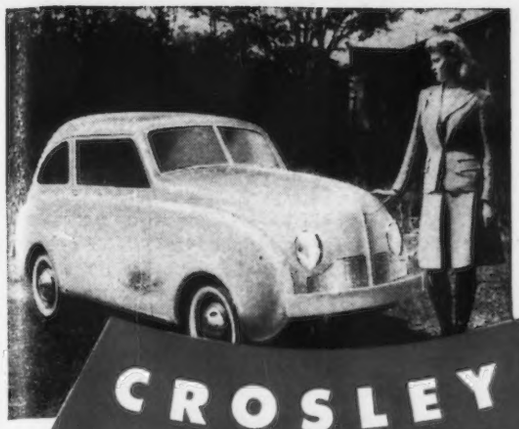
• **L. Ray McDonald** for many years research engineer for Continental Motors Corp., Muskegon, Mich., and Hudson Motor Car Co., Detroit, died recently.

• **Bruno V. Nordberg,** 62, executive engineer for the Nordberg Mfg. Co., Milwaukee, died Aug. 19.

• **Ralph H. West,** 69, president and chairman of the board, West Steel Casting Co., Cleveland, which he founded in 1906, died Aug. 21.

• **Frank P. Cannon,** president of the Cannon-Stein Steel Corp., Syracuse, died Aug. 19 of a heart condition.

• **Henry De Huff** died Aug. 22 after an illness of 4 months. He was a partner in the firm of De Huff & Hopkins, and represented Easton Car & Construction Co. in the Philadelphia area as sales engineer for industrial material handling equipment for more than 25 yr.



CROSLEY ENGINE BLOCKS BRAZED in LINDBERG FURNACE

Over 120 separate parts brazed into a single unit in 1 operation

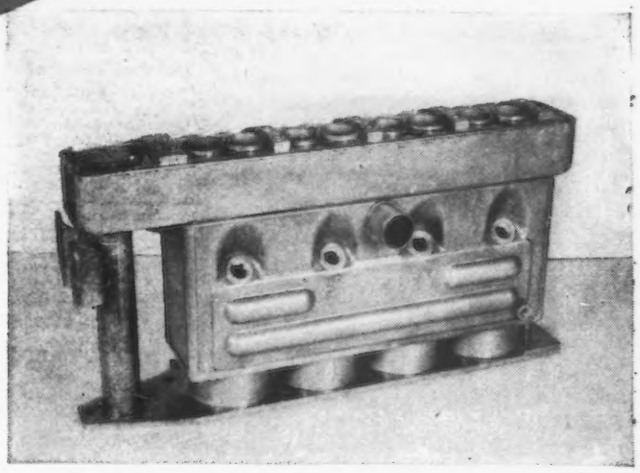
The brazed, all sheet-steel engine block used in the new Crosley car is outstanding among recent engineering developments.

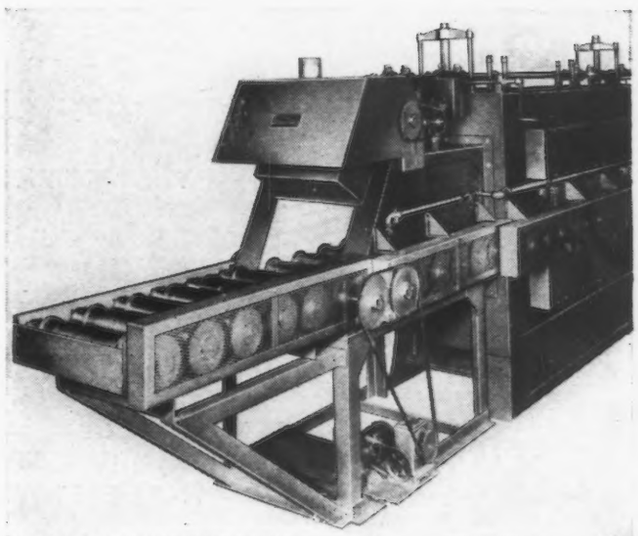
In a single brazing operation, light walled alloy steel tubes and deep drawn steel stampings—over 120 in all—are brazed together in a Lindberg Roller Hearth Brazing furnace to form the Crosley engine block weighing only 14.8 pounds.

Completed engine block assemblies—4 to a tray, are automatically charged into the continuous Roller Hearth Furnace. The work, which at all times is protected by the Lindberg Hyen atmosphere against scaling or decarburization, first enters a preheating zone—then the brazing chamber, where the actual brazing takes place at 2060° F. From the brazing chamber, the blocks go to a slow-cooling zone which reduces the temperature to about 1500° F.

In the next zone, cooled Hyen Hydryzing atmosphere is forced over and through the block by means of fans. This atmosphere quenches the cylinders and valve seats to obtain necessary hardness. Thus the furnace not only brazes but also hardens. The block is finally cooled to about 200° F. in the Hyen atmosphere to prevent scaling. This process of assembling and hardening an internal combustion engine was invented and is being patented by Powel Crosley Jr.—and the Lindberg Engineers worked out a particular furnace, which permits quantity production.

Perhaps too, some of the problems of producing your product can be more efficiently solved by employing brazing methods. Lindberg Engineers will be glad to discuss various possible applications of brazing to your line. Write today for Bulletin 210 and a reprint of an article describing how the Crosley automobile engine block is made. LINDBERG ENGINEERING COMPANY, 2452 W. Hubbard Street, Chicago 12, Illinois.





Lindberg

FURNACES

SUPER-CYCLONE • CYCLONE • HYDRYZING • BRAZING

Dear Editor:

EMBASSY REQUEST

Sir:

I have your issue dated July 4 and notice an announcement to the effect that from Oct. 1 to 4 an iron and steel exposition will be held at the Cleveland auditorium. As the Netherlands Government is very much interested in the development of the steel industry in the United States and in connection with the large orders for iron and steel which are placed and which will be placed in the near future, I would appreciate it very much if you will honor me with an invitation to this event as Director of the Chancellery and Adviser of the Metal Section of the Netherlands Embassy.

J. de JONG
Head of the Chancellery
Netherlands Embassy
Washington

● The exposition to be held in Cleveland, Oct. 1 to 4, is sponsored by the Assn. of Iron and Steel Engineers, Pittsburgh. Formal invitations are not required to attend this meeting. A program listing the technical papers to be presented at this meeting, as well as the highlights of the equipment exhibition, will be published shortly in these pages.—Ed.

FISSION AT BIKINI

Sir:

I have just read your article entitled "Fission at Bikini-(2) Bomb by Manhattan" in the issue of July 18. This is by far the best published article that I have read on this subject, and I would greatly appreciate a copy for my files if you have a reprint available. As an eyewitness of both tests, I can assure you that you did a wonderful job on Test Able. . . . From the (2) appearing in the title, I suspect this to be the second article of a series but I have not seen the first. If there are two articles, consider this a request for both. If more are to follow, I would like to see them also.

L. W. McKEEHAN, Capt., USNR
Chairman, Bureau of Ordnance, Scientific Advisory Board for Operation Crossroads
Navy Dept.,
Washington

HEAT TREATMENT

Sir:

Enclosed please find check for 50¢, for which will you kindly forward a copy of "Practical Tool Room Heat Treatment." This article appeared in the June 6 issue.

DAVID M. EVANS
Waukesha Steel Treating Co.
Waukesha, Wis.

● Reprint has been forwarded.—Ed.

TAPERED TUBES

Sir:

We are interested in locating a manufacturer who can supply us with a machine and dies to manufacture tapered tubes of the following dimensions: length 12½ in., large diam ¾ in., small diam ⅝ in.

V. ZIMMERMAN
Bar-Zim Toy Mfg. Co., Inc.
Jersey City, N. J.

● Assuming that this tubing is to be swedged down from ordinary straight tubing, we believe the job could be handled by any of the standard swedging machine makers. We are forwarding a list of such machine manufacturers.—Ed.

ROSE COKE

Sir:

Can you supply us with names of firms producing Rose Coke and which might be interested in developing an export market in Mexico?

V. H. GONZALEZ
Villa Gustavo A. Madero, D.F.
Mexico

● Rose Coke is the trade name of a coke produced by American Smelting & Refining Co., at Rosita, Mexico. Crowley Tar Products Co., 271 Madison Ave., New York, also markets a coke made from pitch. Your inquiry should be directed to those firms.—Ed.

STRIP PRODUCERS

Sir:

Kindly advise us of steel mills that roll cold-rolled strip.

H. S. HORN
Manhattan Ash Can Mfg. Co., Inc.
New York

● We are forwarding a two-page listing of cold-rolled sheet producers.—Ed.

NAIL FILE MACHINERY

Sir:

Will you please advise us of manufacturers of equipment for making files. One of our customers manufactures pocket knives and wishes to equip one of their knives with a nail file. They would be interested in equipment for rolling in the file serrations and if fast enough they would also be interested in equipment for cutting these edges.

L. K. YOUNG
J. F. Owens Machinery Co.
Syracuse

● The Hess Machine Works, Philadelphia, manufactures file making equipment and can undoubtedly supply you with information on types of equipment and costs.—Ed.

HEAVY RAIL PRICE

Sir:

In the Aug. 15 issue, p. 118, it is noted that the price of heavy rails is quoted in dollars per net ton. I believe that in order to keep the records straight the price under Aug. 14 should either indicate a gross ton basis or be reduced to $38.39 per net ton, which would place it on a comparable basis.

E. H. HUGHES
Purchasing Agent
Kansas City Southern Railway Co.
Louisiana Arkansas Railway Co.
Kansas City

● Reader Hughes' suggestion is an excellent one. Heavy rail prices in the future will carry a reference mark to indicate that the quotation is on a gross ton basis.—Ed.

SPECIAL HINGES

Sir:

We anticipate making a sheet metal article that will require a special hinge. Could you refer us to manufacturers in this line of work? The requirements will be 10 to 20 million lots. Also to go with the hinge we require two locking devices. We are attempting to fasten a metal box to a flat sheet metal surface, something which will snap in place at closing and will stay locked until some manual pressure is applied to release it. . . .

W. T. NARDIN,
President
Moorestown Engineering Co.
Moorestown, N. J.

● Those jobs sound like naturals for Soss Mfg. Co., Detroit. It would also pay you to check the contract manufacturing advertising section of each issue of THE IRON AGE. Many companies with facilities for producing wire forms and small stampings and assemblies list their facilities there.—Ed.

DISABLED VETERANS

Sir:

We should appreciate your sending us a copy of the article "Westinghouse Finds That Disabled Veterans Can Perform 83 Pct Jobs," which appeared in the issue of Sept. 7, 1944. This material will be very helpful to our vocational counselors in their work with disabled veterans whose training programs are being arranged. . . .

R. H. MATHEWSON
Director
Veterans Administration Guidance Center, Cambridge, Mass.

● A set of tear sheets has been forwarded with our compliments.—Ed.

WELDING NICKEL ALLOY STEELS

Sir:

We would appreciate tear sheets of the recent series of articles by T. N. Armstrong on "The Welding of Nickel Alloy Steels."

C. D. D'AMICO
Chief Metallurgist
Joshua Hendy Iron Works
Sunnyvale, Calif.

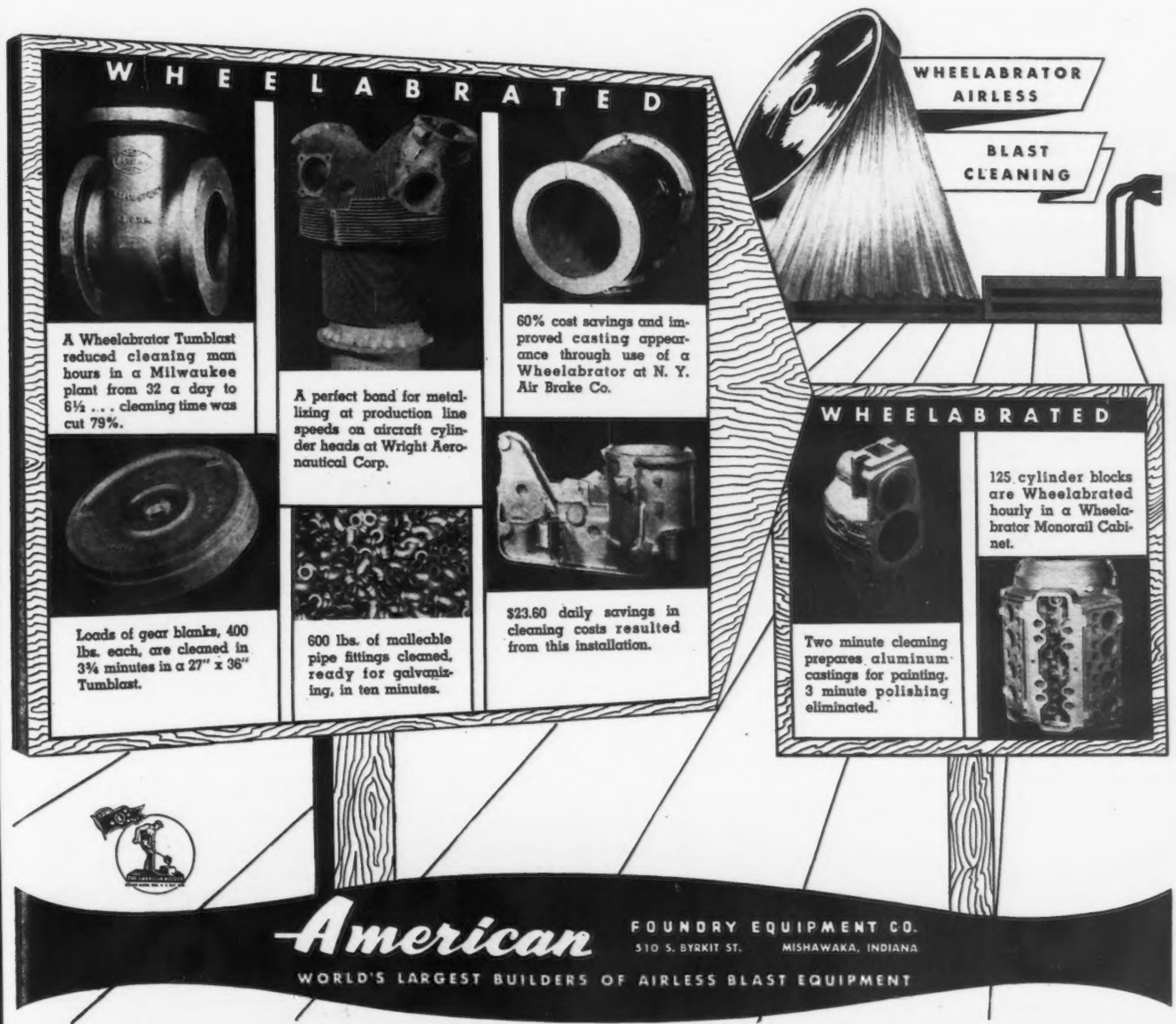
SIGNPOSTS

TO MORE PROFITABLE CLEANING

The overwhelming changeover to Wheelabrator Airless Blast Cleaning Machines that has taken place in industry is one of the signposts to more profitable cleaning. A large percentage of the 3500 Wheelabrators now installed have been replacements of other types of cleaning equipment. As such the Wheelabrator has had to win its way by proved competitive performance: faster cleaning speeds . . . lower production costs . . . higher quality cleaning . . . money saved.

Each installation has been made on the basis of measurable results . . . results that conclusively proved the wisdom of installing Wheelabrator equipment.

Check the signposts below and let them be your guide to more profitable cleaning.


WHEELABRATED
A Wheelabrator Tumblast reduced cleaning man hours in a Milwaukee plant from 32 a day to 6½ . . . cleaning time was cut 79%.
A perfect bond for metallizing at production line speeds on aircraft cylinder heads at Wright Aeronautical Corp.
60% cost savings and improved casting appearance through use of a Wheelabrator at N. Y. Air Brake Co.
Loads of gear blanks, 400 lbs. each, are cleaned in 3¾ minutes in a 27" x 36" Tumblast.
600 lbs. of malleable pipe fittings cleaned, ready for galvanizing, in ten minutes.
$23.60 daily savings in cleaning costs resulted from this installation.
WHEELABRATOR AIRLESS BLAST CLEANING
WHEELABRATED
125 cylinder blocks are Wheelabrated hourly in a Wheelabrator Monorail Cabinet.
Two minute cleaning prepares aluminum castings for painting. 3 minute polishing eliminated.
American
FOUNDRY EQUIPMENT CO.
510 S. BYRKIT ST. MISHAWAKA, INDIANA
WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

This Industrial Week . . .

- ***Priorities May Fail in Their Purpose***
- ***Steel Distribution to Suffer Further***
- ***Lack of Scrap Action Halts Shipments***

THE priority system in steel production, which proved such a miserable failure during the war that it was replaced by the complex and successful Controlled Materials Plan, has been imposed upon the steel industry for peacetime output and appears well on its way towards wrecking a balanced distribution of steel products. For the first time since VJ-Day steel officials are becoming seriously alarmed over the present situation which represents part controlled and part uncontrolled output.

The imposition of a few priorities governing construction and agriculture was not taken seriously several months ago. These priorities, however, were on a customer basis and not on a quantitative basis. The result in recent weeks has been that while the number of priorities has been few the amount of steel which they have taken from regular consumers without preference ratings is becoming substantial.

Indicative of troubles to come are the rumbles in the trade from customers producing strategic materials who will of necessity be forced to obtain priorities for themselves. If the current trend in preference ratings under the present system continues, the same results will occur which took place during early wartime days when "more tickets were issued than there were seats in the theater."

HARDEST hit by the present maldistribution of steel products are warehouse interests which serve the major industries for repair and rehabilitation purposes as well as for the completion of projects which require small amounts of specific steel products. Warehouse stocks are at a new low point this week while demand is reaching an all-time high.

An example of the warehouse service to large industries concerns the nation's railroads which have always gone to the warehouses for urgently needed materials in repairing locomotives and other rolling stock. The necessity for prompt repairs is even greater now in the railroad industry than during the war because of the car shortage.

Steel officials recalling early wartime days look for one of the most hectic 6-month periods ahead as consumers of all types attempt to obtain priority ratings from Washington. If controls are to be retained some steel officials familiar with wartime practice insist that allocations of specific products must be matched against demand if an all-time high in confusion is to be prevented.

THE failure of OPA to act quickly last week after having received a recommendation for higher scrap prices from the Scrap Industry Advisory Committee all but halted the movement of scrap to steel mills. In some cases incoming scrap was hardly one-third of actual consumption, while in other instances shipments were reduced to almost zero. This situation was bound to prevail until such time as a definite answer was given to the scrap industry on the question of scrap prices.

At the meeting held recently it was noted that the solid front in the steel indusry, which had resisted any recommendation for an increase in scrap prices, was broken when some steel company executives voted in favor of an advance in order to relieve the log jam of scrap supplies in hands other than those of steel firms.

While the controversy was raging and the recommendation was finally made for price action, scrap was piling up in dealers' yards and in manufacturers' plants. Only by steel companies digging deep into their inventories and supplementing them with hot metal was the industry able to get over this crisis.

Steel ingot output this week, despite Labor Day which is classed as an official holiday, declined only three points to 87.5 pct of rated capacity. Practically all major steel mills paid time and a half for steel ingot output even though they greatly curtailed or shut down finishing mills.

WHEN the steel scrap price problem is settled, the flow of scrap should reach substantial proportions and thus build up inventories which many weeks ago had reached the danger point. Proof of this can be found in the fact that scrap shipments before the price question came to the forefront again were gradually expanded and were representative of a much better flow of material from both yards and manufacturers' plants.

The tight situation in steel demand which is far above prewar requirements and which is comparable to wartime peaks has driven brass hats from their offices and put them on the road visiting steel companies in an attempt to obtain more steel by throwing their weight around. Some steel company reception registers during the past few weeks would read like a "Who's Who" in American industry.

Large requirements for sheets both pickled and oiled and cold-rolled to be placed by the Army for caskets at the latest count involve more than 50,000 tons. Not all of this steel will be required this year but current needs must be immediately allocated and are expected to disrupt all fourth quarter quotas on flat-rolled products. The number of caskets to be made for returning the overseas dead is around 264,000. Fabrication will be done by two companies in the Chicago area and five in Ohio.

While steel producers have not opened their books for 1947 on the majority of steel products, such action is more or less beside the point because of heavy carryovers representing tonnage promised but not shipped as well as the substantial backlogs on mill order books. No steel firm will be in any hurry to acept 1947 tonnage when the main problem today is to try to catch up with delivery promises which in many instances are two to three months behind.

• **MIXED BIDDING**—While a representative of Inland Steel Co. was en route to Washington to submit a bid on the DPC property at East Chicago, Ind., which is under lease to Inland, WAA changed its mind on the date for closing the bids. Originally set for 11 a. m. Aug. 23, WAA has postponed the time to 3 p. m. Sept. 30 because interested buyers complained they had not had sufficient time to appraise the property. Henry J. Kaiser is reported to be interested. Inland, in order to get the property, must match the highest bid. Annual rated capacity is 733,000 net tons of coke and 427,000 net tons of iron. It is reported that Inland may not avail itself of the opportunity of waiting for 6 months after submission of the other bids, but will make its offer before the new deadline.

• **RAILROAD CAR SHORTAGE**—While the government is now putting its full force behind the drive to obtain more freight cars by rebuilding operations or by saying that car builders get more steel for new rolling stock, it is interesting to note that traffic men and others in the metalworking industry have been screaming their lungs out about the car shortage for months. Just how the government intends to speed up the amount of steel to car builders remains a mystery, unless priorities are instituted. Most steel companies are anywhere from one to three months behind on some car building material deliveries, because of the steel and coal strike.

• **GREAT LAKES STRIKE**—Reports that major steel companies would be seriously affected by the current Great Lakes seamen's strike have been overexaggerated. Most steel companies have not been affected. Furthermore, ore stocks are large because ore was piled up during the steel and coal strikes. This stocking, alone, would have enabled the industry to have gotten over a medium-sized strike, even though it involved far more ships than it has.

• **LABOR DAY SHUTDOWN**—Because Labor Day is a specified holiday in contracts between steel companies and the union, overtime was paid for work on that day. Continuous operations, such as blast furnaces, coke plants and openhearths, were unaffected at most plants by the holiday, but in the majority of cases finishing mills were shutdown. This means another day lost in the production of finished steel products, which already are far tighter in many categories than was the case during the war.

• **COAL NEGOTIATIONS**—When the coal operators and the UMW meet in September, in an attempt to reach a contract, the success of which would take the mines out of the hands of the government, there may be some fireworks. Reports are current that John L. Lewis will ask for the same pay in 48 hr as is now paid for 54. During the current crisis in fuel, most miners are being paid for a total of 9 hr a day, two of which are overtime, six days a week. Main stumbling block, however, will be the operators' stand on the question of unionizing foremen. They are opposed to this, and will carry the case to the Supreme Court. On that basis, the negotiations may be short and sweet with the government still holding the mines.

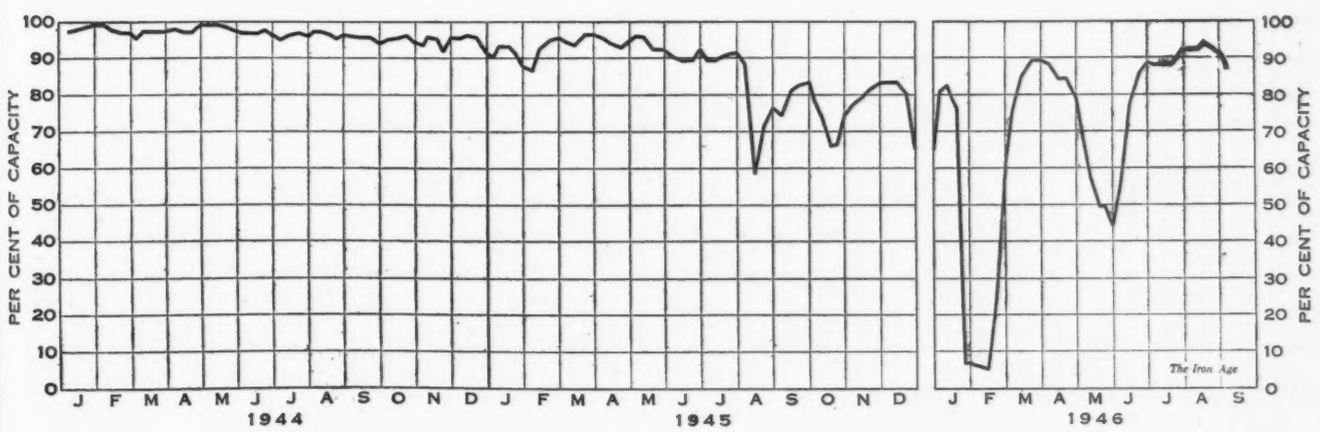
• **GEAR SALES UP**—The gearing industry, as represented by members of the American Gear Manufacturers Assn., shows an increase in volume of sales for July 1946 as compared with June 1946, of 26.8 pct. This report does not include turbine or propulsion gearing. The index figure for June was 407.

• **BOOKS STILL CLOSED**—First quarter 1947 orders may never be placed as such. Carryovers will be so heavy that when the end of the year comes, consumers hoping to place first quarter business will be told that it will be taken but that it will really constitute second quarter business. This is the major reason why nothing is heard of any company opening books for 1947 except for pipe and some material required for construction contracts.

• **WATCHFUL BUYERS**—The recent allotment of sheet bars to nonintegrated mills has brought a flood of inquiries to Detroit offices of these producers from steel-hungry buyers who have never before been on the books. At the same time, established customers naturally expect to be taken care of and may easily require all available sheet.

• **HARRIED CONSUMERS**—Customers extremely short of steel throughout the country have started the same type of pressure instituted during the war, by sending special representatives, many times high company officials, to call on home office brass hats of steel companies in an attempt to obtain supplies. The sum total of these visits is a friendly exchange of greetings. This trek of expeditors is expected to increase to a more furious pace over the next several months.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
August 27.....	98.0	93.0	87.0	88.0	94.0	101.0*	95.0	95.0	103.0	69.0	91.5	75.5	99.0	90.5
September 3....	99.0	77.5	87.5	88.0	94.0	102.0	95.0	99.0	96.0	69.0	101.0	75.5	89.0	87.5

*Revised.

If you weld:

CUPRO-NICKEL . . . MONEL . . .

PHOSPHOR BRONZE . . . SILICON BRONZE . . .

Here are time tested **ARCOS ELECTRODES** **to weld them***

70/30 CuNi
NICUEND

Electrodes with spray type arc for depositing Cupro-Nickel alloy weld metal commonly known as 70/30.

Monel
MONEND

Electrodes with spray type arc for depositing a Monel weld metal.

Phos-Bronze
BRONZEND P

Electrodes for depositing highest quality Phos-Bronze weld metal.

Everdur
BRONZEND E

Electrodes for depositing corrosion resisting bronze weld metal.

While these electrodes are used for welding base metals of a similar analysis, they may also be used for special applications when the base metal or metals are different. Contact your distributor for specific recommendations.

WHEN SO MUCH DEPENDS ON SO LITTLE . . . BE SURE, USE ARCOS

ARCOS

ARCOS CORPORATION • 304 GULF BUILDING, PHILA. 2, PA.

Your Arcos Distributor is well informed. Your Arcos Distributor has Stock.

NEW ENGLAND AND N. Y. CITY

Hartford 2, Conn. — Arcos Corp.

MIDDLE ATLANTIC

Buffalo, N. Y. — Root, Neal & Co.
Erie, Penna. — Boyd Welding Co.
New York, N. Y. — Arcos Corp., Hartford 2, Conn.
New Jersey — Arcos Corp., Phila. 2, Penna.
Philadelphia, Pa. — Arcos Corporation
Pittsburgh, Pa. — Williams & Co., Inc.
Rochester, N. Y. — Welding Supply Co.
Syracuse, N. Y. — Welding Supply Co.

SOUTH and SOUTHWEST

Atlanta, Georgia — J. M. Tull Metal & Supply Co., Inc.
Baton Rouge 17, La. — Louisiana Welding Co.
Borger, Texas — Hart Industrial Supply Co.
Houston, Texas — Champion Rivet Co. of Texas
Kingsport, Tenn. — Slip-Not Belting Corp.
Knoxville, Tenn. — Slip-Not Belting Corp.
Albuquerque, N. Mex. — Industrial Supply Co.
New Orleans, La. — The Gulf Welding Equipment Co.
Oklahoma City, Okla. — Hart Industrial Supply Co.
Pampa, Texas — Hart Industrial Supply Co.
Phoenix, Ariz. — Arizona Welding Eqpt. Co.
Tucson, Ariz. — Arizona Welding Eqpt. Co.
Tulsa, Oklahoma — Hart Industrial Supply Co.

MIDDLE WEST

Chicago, Ill. — Machinery & Welder Corp.
Cincinnati, Ohio — Williams & Co., Inc.
Cleveland, Ohio — Williams & Co., Inc.
Columbus, Ohio — Williams & Co., Inc.
Detroit, Michigan — C. E. Philips & Co., Inc.
Ft. Wayne, Ind. — Wayne Welding Sup Co., Inc.
Indianapolis 2, Ind. — Sutton-Garten Co.
Kansas City, Mo. — Welders Supply & Repair Co.
Milwaukee, Wis. — Machinery & Welder Corp.
Minneapolis, Minn. — Machinery & Welder Corp.
Moline, Ill. — Machinery & Welder Corp.
St. Louis, Mo. — Machinery & Welder Corp.
St. Paul, Minn. — Machinery and Welder Corp.
Toledo 2, Ohio — Williams & Co., Inc.
Wichita, Kansas — Watkins, Inc.

WEST COAST

Bakersfield, Calif. — Victor Equipment Co.
Fresno, Calif. — Victor Equipment Co.
Los Angeles, Calif. — Victor Equipment Co.
Portland, Ore. — J. E. Haseltine & Co.
San Diego, Calif. — Victor Equipment Co.
San Francisco, Calif. — Victor Equipment Co.
Seattle, Wash. — J. E. Haseltine & Co.
Spokane, Wash. — J. E. Haseltine & Co.
Tacoma, Wash. — J. E. Haseltine & Co.

FOREIGN

Honolulu, Hawaii — Hawaiian Gas Products, Ltd.
Monterrey, N. L. Mexico — Electrodos Monterrey, S. A.
Montreal, Canada — G. D. Peters & Co. of Canada, Ltd.
Chile, Bolivia, Peru — W. R. Grace Company
San Jose, Costa Rica, A. C. — Distribuidora S. A.
San Juan 6, Puerto Rico — Frank Rullan & Associates, Inc.

Foreign Tinplate Allotments Reflect Eased U. S. Needs

Washington

• • • Reflecting the drop in domestic food packing requirements, the fourth quarter allotment of tinplate for export has been increased 24,000 tons over the third quarter total to 136,000 tons.

All countries, with the exception of Portugal and Spain, receiving allotments during the third quarter were again taken care of, and in most cases received larger amounts.

The quotas shown in the accompanying tabulation are reasonably firm, according to CPA. However, the Office of International Trade, Dept. of Commerce, the claimant agency for export steel products can shuffle the allotments at their discretion.

How much American tinplate will go to Russia under the OIT export program is still a big mystery. Listed as receiving no allotment, as in the third quarter, Russia will still get her share, according to informed sources here. Russia asked for 11,411 tons during the first half of the year, and received 2317 tons.

Actually, the Office of International Trade can take care of such part of the USSR requirements as it feels valid through shifts from allotments to other countries.

Tinplate Export Allocation
(In Tons)

	Fourth Quarter Quota	Third Quarter Quota
USSR	0	0
Australia	30,000	25,000
New Zealand	4,000	4,000
South Africa	8,000	6,850
Middle East	750	650
Turkey	1,000	1,000
Philippines	1,500	1,500
French N. Africa	4,000	1,500
Continental France	0	0
Belgium	5,000	2,000
Netherlands	5,000	3,000
Denmark	2,000	2,000
Norway	5,000	5,000
Sweden	4,500	3,500
Italy	2,5 0	2,500
UNRRA	1,500	1,250
China	2,500	1,500
Switzerland	1,000	500
Finland	[a]	100
Newfoundland	0	0
Madagascar	[a]	0
Eire	[a]	0
Greece	1,000	0
Portugal & Spain	0	2,150
New Caledonia	0	0
Latin America	52,250	45,000
All other	2,000	3,000

[a] To be taken care of from allotment to all others.

What countries will have to give up part of their quota is anybody's guess. Russia's share will probably depend largely on the State Dept., in view of the troubled international situation.

Increases in the fourth quarter were granted largely to areas below the Equator, notably Australia, New Zealand, South Africa and South America, whose heaviest food pack comes in the fourth quarter and the first quarter of next year. Of the total allocation, 94,250 tons are going to these areas.

Australia's increase of 5000 tons was the largest granted to any individual country, largely because the "Aussies" received less than half of their third quarter stated requirements.

Spain and Portugal did not receive a fourth quarter quota. Madagascar and Eire, newcomers to the program, did not receive firm allotments, but will be taken care of from the 2000 ton emergency quota, as will Finland. New Caledonia, another newcomer, was left out of the picture, as was Continental France.

Electrolytic Tinplate Growth Retarded By War Restrictions

New York

• • • The advent of electrolytic tinplate lines a few years ago was accompanied in some cases by predictions that a very large proportion of tinplate would in a few years be made by that process. So far this optimistic view has not been substantiated because of government regulations affecting use of tinplate. Nevertheless for a new product the growth of electrolytic tin and terneplate output since the installation of the first line has been quite substantial.

In January 1945 electrolytic tin mill products constituted 24 pct while hot dipped accounted for 76 pct of the total. The growth since that time in the participation of electrolytic to total output has been slow but steady. There are bound to be some fluctuations at different periods throughout the year when a predominance of hot dipped tinplate is a necessity because of certain food packing seasons.

The real test of the popularity for electrolytic tinplate has not materialized yet because during the war tinplate production was closely controlled and involved a substantial proportion of plate for food packaging. For this reason it is too early to draw any conclusions concerning the future growth of electrolytic material after controls are completely removed.

The steel shortage today has affected the distribution of tinplate just as it has other products. Furthermore, steel companies which were granted a price increase on Mar. 1 amounting to $5 a ton were unable to realize this because yearly contracts had already been made with major can companies. It was not possible to obtain the higher price from miscellaneous customers who were well aware of the primary can company contracts.

The sum total of this factor has been that there is probably no unusual push behind the sale of tinplate at the present time, since it is selling at $5 a ton under the permissible ceiling. This situation ties in with the more or less static position of electrolytic tinplate when compared with hot dipped, because the full demand which will come for electrolytic from

general line can goods has not yet been felt.

It is probable that during 1947 the production of electrolytic tin and terneplate will make a marked increase percentagewise as the price situation changes and as the steel industry dissipates the effects of the 1946 strikes and unprecedented steel demand. Furthermore, it is expected that with major can companies still experimenting with certain food packs a changeover in some instances will be made at a later date favoring the electrolytic product.

U. S. Sues Can Makers

Washington

• • • **Two civil suits,** charging the American Can Co. and the Continental Can Co. with violations of the anti-trust laws have been filed in the Federal Court in San Francisco by the Dept. of Justice.

Wendall Berge, assistant attorney General, said here that the suits charge each of the defendants with having "illegally entered into contracts for the leasing of machinery for sealing containers upon condition that the lessees would agree to purchase their total requirements of metal and fibre containers exclusively from the lessor, and that each of the defendants for more than 30 yr has refused to sell or lease such machinery" unless such terms were agreed to.

Price Recommendation And Increases Enacted

Washington

• • • **Establishment of** a wholesale price for resistance welding machines at a level permitting manufacturers to buy, recondition and sell with a guarantee has been recommended to War Assets Administration by the industry's advisory committee.

Other recommendations made at the Aug. 27 meeting included offering spare parts stocks to the manufacturers because of their many sales outlets and sales of special machines, which have little or no nonmilitary use, by sealed bid for recovery of component parts rather than as scrap.

More than 1900 such machines, costing $10 million new, have been turned over to 14 regional offices for disposal. More will be declared surplus and committee recommendations will be given full consideration, WAA said.

•

• • • **Resellers of** heavy duty mechanical jacks, used for industrial purposes, have been granted a percentage pass-through of the Mar. 27 increase in manufacturers' maximum prices to replace the dollar-and-cent pass-on previously permitted, effective Aug. 30.

OPA says that resellers affected will be permitted to raise their maximum prices the same percentage amounts as their net invoiced costs are increased due to the advance in price at the manufacturers' level.

•

• • • **Ceiling prices** of round and sawn wooden mine materials, industrial blocking (used in shipping finished steel) and cross bars have been increased by varying amounts ranging from 10 to 28 pct, effective Sept. 3.

Except in Zone Five (the Lake states) round wooden mine materials were increased 10 pct, and sawn wooden mine materials and industrial blocking 20 pct. A comparable increase in Zone Five was granted for round materials in February 1946. This action increases the ceiling on sawn wooden mine materials in Zone Five by 15 pct, which is added to the increase on these materials granted in February. Cross bars were increased an average of 28 pct.

No increases were made in the currently effective prices for wedges.

•

Washington

• • • **An interim price** increase of 10 pct granted last March for certain low pressure valves and fittings will be continued indefinitely, OPA has announced. A survey of the industry, had not been completed as of August 31, the date on which the March price order was to have expired.

•

Asks Reopening of Coal Contract Negotiations

Washington

• • • **In a move** designed to effect return of seized coal mines to their owners, the government has requested that representatives of the United Mine Workers and the mine operators resume contract negotiations in Washington on Sept. 10.

Adm. Ben Moreell, Coal Administrator, set the date in identical letters addressed to Ezra Van Horn, chairman of the mine operators' negotiating committee, and John L. Lewis, president of the United Mine Workers.

This is the first formal move to reopen negotiations between the operators and the UMW since the government seized the mines nearly 3 months ago.

Tin and Terneplate Shipments

Hot Dipped vs Electrolytic
(net tons)

Source: American Iron & Steel Institute
Compilation: The Iron Age

	Hot Dipped	Pct of Total	Electrolytic	Pct of Total	Total
1945 January	179,433	76	57,339	24	236,772
February	152,705	74	54,415	26	207,120
March	195,407	68	92,657	32	288,064
April	198,066	70	86,693	30	284,759
May	182,154	70	78,464	30	260,618
June	202,287	70	85,074	30	287,361
July	190,317	71	78,765	29	269,082
August	176,882	72	68,411	28	245,293
September	150,349	71	62,762	29	213,111
October	145,147	69	65,879	31	209,026
November	141,226	68	67,445	32	208,671
December	145,836	70	63,730	30	209,566
1946 January | February*	182,474	68	84,460	32	266,934
March	178,605	72	70,315	28	248,920
April	170,910	65	93,821	35	264,731
May	158,545	66	82,019	34	240,564
June	172,765	70	74,208	30	246,973

* Steel strike.

Ohio Losing Industrial Position in Relation To Nation's Progress

Columbus

• • • **Ohio's industrial** growth is slowing down in relation to the nation's total gains, despite a good war production record.

This is one of the facts revealed in a study, "Recent Changes in the Concentration of Manufacturing," published by Professor Alfred J. Wright of the geography dept. at Ohio State University.

Professor Wright stressed that Ohio still is gaining industrially, but not at the same pace as other parts of the nation and as the nation as a whole.

Major shifts, according to Professor Wright's study, have been in the fields of form implement manufacture and clay and earth-moving machinery manufacture from Ohio to Illinois, West Virginia and California.

Shifts in manufacturing have stimulated greater industrial vigor in Michigan and Illinois, while Wisconsin, Ohio, and Indiana have lost some vitality, according to the study.

The overall pattern of industrialization as revealed in Professor Wright's paper shows that despite heavy government financing during the war, the general pattern of industrial concentration remains the same in the United States.

West Coast states, notably California, made large wartime strides, but these were not significant enough to change the national picture, especially since many of the products made were strictly "duration" goods, the study reveals. California will keep part of its gains, however.

If any part of the country forges a permanent type of industrial progress, it would probably be the Texas-Oklahoma west-south-central region where sales of war plants for peacetime production have been considerable.

Interesting facts about Ohio manufacture which emerged from the study included the surprising statistic on Ohio's production of shipbuilding and ship repair goods.

Michigan and Ohio received at least two-thirds of the government-financed facilities for making guns, ordnance and explosives; aircraft, engines and parts, and ship construction and repair, according to the OSU study. Wisconsin's largest item was for shipyards.

Nine Industrial Fields In Canada Affected By Labor Union Strikes

Toronto

• • • **Nine Canadian** industrial fields in Canada have been directly affected by labor troubles and almost 40,000 union workers are idle due to strikes. Taking into consideration the number of employees not within the bargaining units of striking firms, plus shutdowns and slowdowns of manufacturers dependent upon strike-bound plants for raw materials, it is estimated that a minimum of 100,000 persons have been forced into idleness as a direct result of the strikes. Throughout the strike picture in the various industries the issue is identical. Trade unions are demanding higher pay, shorter working hours, union recognition. The unions involved are largely members of the Canadian Congress of Labor (CIO).

By provinces, Ontario has been the hardest hit and has approximately 30,000 workers on strike; Nova Scotia and Quebec are next in line with upwards of 4000 steel workers out at Sydney and 3,000 textile plant employees out at Valleyfield. Alberta, British Columbia and Manitoba have about 200 printers on strike.

By industries, with the date of commencement in brackets, the strike line-up is as follows: Copper and brass, New Toronto, 900 workers (May 18); printers, Ottawa, Hamilton, Winnipeg, Vancouver and Edmonton, 400 workers (May 30, except Winnipeg, Nov. 9, 1945; textiles, Valleyfield, Que., 3000 (June 1); automobile, Windsor and Chatham, 4500 workers (June 19-28); rubber, Toronto, Kitchener, Hamilton, New Toronto, Bowmanville and Oakville, 10,000 workers (June 24); electrical, Hamilton, Toronto, Welland and Leaside, 6700 workers (July 5, 8, 9); steel, Hamilton, Sault Ste. Marie and Sydney, N. S., 12,000 (July 15).

Hiroshima Revisited

. . . John Hersey has written a story on the atomic bomb which should become a part of the recorded history of World War II. It is an account of the effects of the bomb on Hiroshima and its people which appears in the Aug. 31 issue of *The New Yorker*. Mr. Hersey's work is an important contribution to the store of public knowledge of the atomic bomb and its potentialities.

The Editors.

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LINEAR MOTOR: *Quarter mile long electric catapult developed by Westinghouse for the Navy uses a 24-ton flywheel in conjunction with a 1100-hp aircraft engine for rapid launching from small fields. Details will appear in next week's issue.*

o o o

Price Rise Vote of Scrap Committee Marked by Split Across Industry Lines

New York

• • • **A sharp divergence** of opinion, cutting across industry lines marked the Aug. 28 meeting of the OPA Scrap Industry Advisory Committee at the Hotel Roosevelt in New York. Pointing up the difficulties faced by OPA in arriving at its decision was the fact that on almost all points under discussion there was disagreement within the ranks of the steel representatives, and the dealers.

The committee acted favorably on all points recommended by the Institute of Scrap Iron & Steel. An across-the-board price increase, an increase in preparation charges and a ceiling on unprepared scrap. It is understood, however, that while a general price increase was recommended the amount was not specified.

OPA officials declined to comment on the increase in preparation charges although it is known that the committee agreed to recommend such an increase to OPA. Imposition of a ceiling on unprepared scrap was opposed in principle by most of the dealers on the ground that any further OPA restrictions would increase the difficulties of doing business. Nevertheless many dealers overcame their objections to vote in favor of such a ceiling, on the ground that it was the only way to keep outside interests and unscrupulous dealers from using unprepared scrap for bartering purposes.

Despite the fact that the recommendation for an across-the-board-increase was carried and presented to OPA as the majority opinion of the Advisory Committee the subject caused cleavage across industry lines. It is known, as it has been for several months, that there are some mill operators who would not object to a scrap price increase if it would bring out more tonnage. But it was not generally realized that all dealers do not feel they need a price boost.

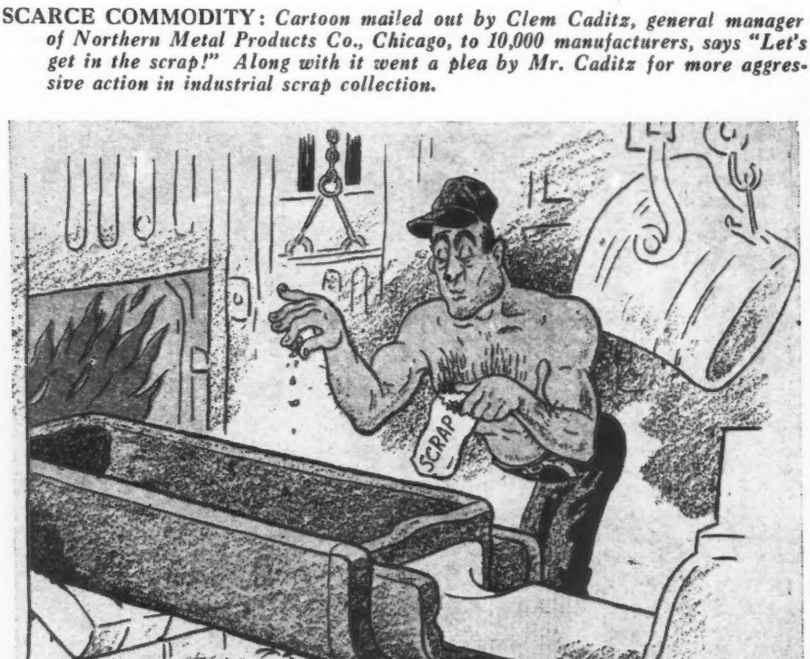
Observers who jumped to the conclusion that dealer opposition to a price rise was probably an attempt to curry favor with the steelmakers present at the meeting changed their opinion after considering the freight rate angle. It was pointed out that the dealer near a mill had a tremendous advantage over one several hundred miles away. A Pittsburgh dealer, for instance, gets $19.45 a ton for his No. 1 heavy melting scrap. A dealer in Boston who has to do the same amount of work in preparing his material gets about $4 less though he may not have to go as far afield for his material. Dealers with industrial accounts often have no preparation to worry about but competition will push their buying price up by the amount the ceiling is raised. In the end these men merely handle more money but make no more actual profit. Prosperity for dealers in certain strategically located areas could mean bankruptcy for others not so fortunately situated.

Many dealers were opposed to the proposition that a ceiling be placed on unprepared material because it would further limit their normal freedom of action and because of the obvious difficulties inherent in such a scheme. Yet it is understood that this seemed to them a lesser evil than the present free market in which the scrap dealer's province is being invaded by outside interests who purchase unprepared material to sell to mills and foundries in exchange for plates, structurals and cast iron products.

Washington sources report that there is considerable discussion there as to the legality of imposition of ceilings on unprepared scrap though it is believed that if the OPA decides to accept the recommendation of the Scrap Industry Advisory Committee a way can be found to accomplish this end.

Warren M. Huff, OPA metals price executive, who represented the government at the committee meeting stated that he was well aware of the need for speed in announcing OPA action on the recommendations adding that knowledge of the possibility of a price increase would cut down the already reduced flow of scrap until the industry had a definite announcement. Observers are inclined to agree that some loss was inevitable between the time of the meeting and the actual OPA announcement, though the larger dealers continued to ship because they considered it poor business to pay a dollar or so to rehandle and store prepared material while awaiting price action.

SCARCE COMMODITY: *Cartoon mailed out by Clem Caditz, general manager of Northern Metal Products Co., Chicago, to 10,000 manufacturers, says "Let's get in the scrap!" Along with it went a plea by Mr. Caditz for more aggressive action in industrial scrap collection.*



Demands Cut in Priority Aids To Curb Steel Black Market Activities

By GENE HARDY
Washington Bureau

Washington

• • • **Contending that** government priorities for steel products were creating a black market and preventing the steel industry from returning to normal operations, the General Steel Products Industry Advisory Committee at its meeting with CPA on Aug. 29 demanded assurances that priority assistance would be held to a minimum.

CPA officials headed by P. J. Treacy, Steel Division Director, told the industry representatives that applications for priority assistance were being carefully screened and that during the fourth quarter only a little more than 5 pct of the estimated total output of finished products would be sold on rated orders. In the case of flat-rolled products, this percentage might run as high a 10 or 12.

CPA also said that it would deny most applications for ratings made under PR 28, the bottleneck-breaking regulation, particularly those asking for material in excess of current needs.

During the fourth quarter priority ratings on steel will be issued for housing items, export needs, bad order freight cars, bottleneck breakings, and the needs of the Army, Navy, Veterans Administration and the Panama Canal. The export program will take 210,000 tons of general products and 136,000 tons, of tinplate during the final quarter. Housing will take 330,000 tons, of which 90,000 tons are for prefabricated dwellings. No formal priority assistance will be granted to farm machinery producers in the fourth quarter.

The industry claimed that CPA had no control over the steel going into housing once deliveries were made, and that is the situation creating the black market. CPA officials were not able to make a satisfactory reply to this claim, other than to say that housing requirements were carefully screened.

This claim has some validity in that newcomers are asking for excessively large amounts and CPA has no historical background on which to make their determination.

Another problem discussed at the meeting was the shortage of zinc for galvanizing. While withdrawals from the government stockpile have been permitted, the remaining 140,000 tons are not the prime grade necessary for galvanizing. The supply of zinc in the hands of the industry is estimated at barely enough for one month's operation.

Steel industry officials attending the meeting were: W. J. Adamson, Allegheny-Ludlum Steel Corp.; L. M. Parson, U. S. Steel Corp.; Joseph L. Block, Inland Steel Co.; J. M. Schlendorf, Republic Steel Corp.; John Anderson, Jones & Laughlin Steel Corp.; J. A. Henry, Weirton Steel Co.; Paul Mackall, Bethlehem Steel Co.; R. F. Sentner, Wheeling Steel Corp.; J. H. Parker, Carpenter Steel Co.; R. C. Todd, American Rolling Mill Co.; and W. E. Watson, Youngstown Sheet & Tube Co.

WAA Establishes 23 New District Offices

Washington

• • • **WAA has established** 23 district offices to speed disposal of surplus property under direction of the 33 regional offices.

The offices will provide information concerning site sales, national sales programs, regional programs and information concerning policy and procedure for obtaining surplus in all of the 33 regions.

The offices, most of which were formerly certification or sales offices, are in the following cities: Hartford, Conn., Portland, Me., Montpelier, Vt., Newark, N. J., Wilmington, Del., Manchester, N. H., Providence, R. I., Indianapolis, Ind., Des Moines, Iowa, Milwaukee, Wis., Wichita, Kan., Albuquerque, N. M., Reno, Nev., Washington, D. C., Baltimore, Md., Charleston, W. Va., Columbia, S. C., Jackson, Miss., Fargo, N. D., Sioux Falls, S. D., Cheyenne, Wyo., Boise, Idaho, and Phoenix, Ariz.

FOUNDRY FIRE: *Smoke billows skyward as the Patterson Foundry & Pattern Works goes up in smoke at Rockford, Ill. Four company-owned buildings and a company-owned apartment house were destroyed in the $300,000 blaze.*

CPA and NHA Take Steps to Speed Housing Program

Washington

• • • **A number of** drastic steps have been taken jointly by CPA and NHA to speed the lagging emergency housing program in order to get a larger number of units completed before winter sets in. These include:

Transfer of the handling of priorities and cut-backs in nonhousing from CPA to NHA; mandatory earmarking and reservation of 75 pct or more of the materials on the critical list for priority claimants; addition of more building materials to the critical list (Schedule A); slashing permitted nonhousing construction by $14 million weekly; and limitation of soil pipe for nonhousing to 7 pct of output.

While actual procedure for priority issuance remains unchanged, on and after Sept. 10, all new applications for authorizations and HH priorities will be filed under the new Housing Expediter Priorities Reg. 5 instead of CPA 33. This gives future HH and HHH ratings double authority, that of the Housing Act as well as that of the Second War Powers Act.

While CPA will continue to handle compliance functions relating to use of HH ratings, set-asides and other restrictions, the enforcement of maximum prices and veterans preferences has been delegated to OPA.

An additional 27 materials in short supply have been placed on Schedule A, bringing the total to 57. Dealers and distributors must reserve for priority ratings 75 pct of receipts of 43 of the items listed; even larger proportions of the remaining 14 must be set-aside. Such set-asides and reserves must be held indefinitely in contrast with the previous 21 to 30 days.

Included in the 27 additional materials which have been placed on Schedule A were the following metal items:

Cooking and heating stoves and ranges, including space heaters; gutters and down spouts; combustion controls; household lighting fixtures; other than portable; insect screen cloth; kitchen and bathroom metal cabinets, to be built in; metal weather stripping; oil burners and domestic stokers; plumbing fixture fittings and trim, including brass tubular goods; raceways (rigid, flexible and thin wall conduits and fittings); and, septic tanks.

Also, steel joists; oil and water storage tanks (up to 550 gal); caulking lead; copper water tubing; cable; steel and wrought iron pipe, including galvanized, from three-eighths to 4 in. and including related nipples and fittings; structural shapes from either steel or aluminum; stuccowire mesh; range boilers; and concrete reinforcing bars.

Seven of the 14 additional materials whose set-asides are 75 pct or more involve metal. They are: bathtubs, 95 pct by units; lavatories, 90 pct by units; water closets, tanks and bowls, 90 pct by units; cast iron soil pipe (under 5 in.), 80 pct by producers' billing prices; warm air furnaces, 75 pct; radiation, 75 pct; and, kitchen sinks, 75 pct by units.

Two other orders were issued affecting cast iron soil pipe. The first limits production for nonhousing to 7 pct of the previous month's tonnage, that is, at least 93 pct of pipe output must be in sizes needed for housing. The second order provides that the pipe shall not be used for any purpose except for installation, repair or maintenance of sewage disposal systems in buildings and that such pipe shall not be used beyond 5 ft from the building line except when required for replacement purposes.

At the same time, it was announced that authorizations for nonhousing construction—commercial, institutional and industrial—will be trimmed back to $35 million weekly. Although the current ceiling is around $48.8 million, more recently CPA has been authorizing applications at the rate of only about $45 million, it was revealed.

Aside from the cut-back in authorizations, many nonhousing constructors expect to feel the pinch immediately and believe that many projects already under way cannot be completed. They point out that the already short supply of soil pipe and other items, now further restricted, have been hampering such construction.

Despite transfer of authority, Administrator John D. Small stated that the CPA reserved the right to "review" any decisions of Housing Expediter Wilson W. Wyatt in the matter of industrial construction applications.

At the same time, Mr. Small said he was prepared to transfer up to 1500 members of his CPA staff and construction funds (for administration) to Mr. Wyatt's NHA to carry out the program. It was essential, he said, to get as many homes as possible completed "before the snow flies."

These new developments were not unexpected here. They followed closely previous actions, on a smaller scale, for carrying out Wyatt's declared intentions of getting more materials channeled into his housing program.

NO SECRET NOW: *Once a carefully guarded project, the Navy's largest plane has been "unveiled" by Lockheed. The Navy originally ordered* 50 *of these* 168*-passenger craft, will probably take only two. It has a range of* 5000 *to* 7000 *miles, operates at a ceiling above* 25,000 *ft at speeds in excess of* 300 *mph.*

Weekly Gallup Polls . . .

State Dept. Should Increase Proselytizing Functions

• • • **With Russia widely accused** of trying to promote Communist doctrine in other countries, the average American thinks the United States should see to it that the world is told the advantages of the American type of democracy, according to George Gallup, director, American Institute of Public Opinion.

The State Dept's program of selling American democracy abroad has the backing, in principle, of nearly seven out of every ten voters. Presumably the public would support measures to make the program increasingly effective.

This public attitude is significant when considered against the backdrop of current international events.

Observers in Paris are reporting that, more and more, the Peace Conference shows the world dividing into two blocs, one Russian-dominated and the other led by the Western Powers. The two blocs, it is said, are engaged in a titanic struggle of ideas and ideologies to determine which group will come out with greater world influence and power.

That the common people of the United States desire to see the people of other countries made familiar with the strong points of our form of government is indicated in the following poll by the institute.

"Should the United States do everything it can to tell other nations the advantages of our type of democracy for the common people of the world?"

The vote:

	Pct
Yes	68
No	19
No opinion	13

As previous polls have shown, a substantial majority of voters believe that Russia is out to try to dominate the world. Judging by this survey, the mood of the country is not to let the Russian challenge go unanswered, but to do some active proselytizing abroad on behalf of democracy.

What does the average American value most in the kind of government he lives under? What are the advantages of our type of democracy?

The answer is indicated in the responses to a second question in this poll. All voters were asked:

"What would you say is the greatest advantage of our type of government?"

The overwhelming proportion of answers have to do with freedom of one kind or another, mostly the basic freedoms in the Bill of Rights.

The vote follows:

	Pct
Freedom in general	24
Freedom of speech and of press	19
Freedom of opportunity	7
Freedom of worship	5
Equal rights	5
The four freedoms	4
Free enterprise, competition in business	3
People have a voice in government	17
Miscellaneous	6
No advantages	1
No opinion	21

Some people named more than one factor; hence the table adds to more than 100 pct.

• • • **American attitudes toward** Russia have undergone profound changes since the time, only 11 months ago, when a majority felt that Russia could be trusted to cooperate with us in world affairs.

Today nearly eight in every ten voters disapprove of the course Russia is taking in world affairs, and the majority believe that country is out to try to dominate the world.

American impatience with communist tactics shows itself not only in attitudes toward Russia, but in attitudes toward the Communist Party in the United States. The public shows little inclination to display tolerance toward the communist viewpoint.

Part of this intolerance undoubtedly springs from a belief which many voters hold, that American citizens who belong to the Communist Party are loyal to Russia rather than to the United States.

Public Would Have Nation Engage in Propaganda Work To Counteract Soviet Line

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This is shown in the following poll just completed by the institute:

"In general, do you think most American citizens who belong to the Communist Party in this country are loyal to America or to Russia?"

The vote:

	Pct
Believe they are loyal to U. S.	23
Believe they are loyal to Russia	48
No opinion	29

Doubt as to loyalty is probably one reason why the public is opposed to letting Communists hold government jobs in the United States. The attitude on that point was measured as follows:

"Should U. S. Communists be permitted to hold civil service jobs (regular government jobs) in this country?"

The vote follows:

	Pct
Yes	17
No	69
No opinion	14

A very substantial number of people in this country even go so far as to say that Russia has spies at work here in the United States.

Whether the public is right or wrong in this supposition, the fact remains that it is a widely prevalent one.

A cross-section of the voting population was asked:

"Do you think Russia has spies at work here in the United States?"

The vote:

	Pct
Yes	78
No	5
No opinion	17

Studies on Russia have found that American public opinion reacts very sensitively to Russian acts and statements by Russian leaders.

Thus while distrust of Russia

(CONTINUED ON PAGE 136)

Alloy Steel Production Down but Still Better Than Prewar Rate

New York

• • • **The ratio of alloy** steel output to total steel production has dropped substantially since wartime years but has not yet reached nor is it expected to reach the prewar figure of 6 pct.

At one time in 1943 alloy steel constituted almost 16 pct of all steel produced. During 1944 an average of close to 12 pct was maintained, but immediately after the war demand dropped off rapidly, while requirements for carbon steel were maintained at a high level.

Within the past few months the ratio of alloy steel to total steel produced has shown a gain which might bear out the contention made some time ago that it would stabilize around 10 to 11 pct of total steel production, compared with 6 pct in 1939. It is even possible that over the next several years because of the greater demand for low alloy high tensile steel and the substantial increase expected in the shipments of stainless steel, that the participation of alloy steels will approach wartime proportions.

Despite the tremendous increase in electric steel capacity the industry's openhearths have kept a tenacious hold upon their share of alloy steel produced. In recent months there are indications that this trend will continue and that any effort on the part of electric furnaces to substantially raise their share of the total will be vigorously resisted.

In 1939 openhearths produced 77 pct of the total alloy steel output. However, during the war years and with the substantial expansion of electric furnace capacity, the openhearth percentage of alloy dropped as low as 62 pct in 1944 with an average for that year showing 66 pct. Since January 1945 the percentage of openhearth alloy to the total has increased.

During the first six months of 1946 there has been a wide variation between the position of openhearth alloy vs electric alloy. However, in June despite the tremendous requirements from the openhearths for carbon steel, these units were able to produce 73 pct of total alloy steel.

As production of stainless steel increases, however, there is a possibility that the percentage of electric alloy will rise steadily over the next several years. There is little doubt, however, that it will take some time to fully utilize the tremendous expansion in electric steel capacity built for war.

Alloy Steel Production vs. Total Steel Output

1939-1946

Net Tons. 000 Omitted

YEAR	Alloy Steel Production	Alloy Steel Pct of Total Steel	Total Steel Production
1939	3,212	6.1	52,799
1940	4,966	6.3	66,983
1941	8,206	9.9	82,839
1942	11,526	13.4	86,032
1943	13,116	14.8	88,873
1944—January	919	12.0	7,592
February	905	12.6	7,194
March	953	12.2	7,826
April	889	11.7	7,594
May	931	12.2	7,703
June	866	12.0	7,234
July	854	11.4	7,498
August	875	11.7	7,499
September	871	12.0	7,235
October	842	11.0	7,621
November	804	11.0	7,279
December	848	11.5	7,366
1944—Total	10,497	11.5	89,642
1945—January	908	12.6	7,206
February	862	12.0	6,655
March	992	12.9	7,708
April	918	12.6	7,292
May	897	12.0	7,477
June	793	11.6	6,842
July	732	10.5	6,937
August	502	9.3	5,736
September	495	8.3	5,993
October	489	8.7	5,598
November	517	8.3	6,201
December	494	8.2	6,051
1945—Total	8,599	10.8	79,736
1946—January	327	8.4	3,872
February	130	9.3	1,393
March	531	8.2	6,507
April	528	9.1	5,806
May	394	9.7	4,072
June	543	9.7	5,625

Trends in Alloy Steel Production—Openhearth vs. Electric

1939-1946

Source—American Iron & Steel Institute. Compilation—The Iron Age

Net Tons. 000 Omitted

YEAR	ALLOY STEEL OUTPUT				
	Openhearth		Electric		
	Production	Pct of Total	Production	Pct of Total	Total Production
1939	2,462	77	750	23	3,212
1940	3,679	74	1,287	26	4,966
1941	5,743	70	2,463	30	8,206
1942	8,133	71	3,393	29	11,526
1943	9,221	70	3,895	30	13,116
1944—January	586	64	333	36	919
February	584	64	321	36	905
March	627	66	326	34	953
April	581	66	308	34	889
May	610	66	321	34	931
June	576	67	290	33	866
July	572	62	282	33	854
August	577	66	298	34	875
September	558	66	283	34	841
October	557	66	286	34	843
November	559	70	244	30	803
December	587	69	261	31	848
1944—Total	6,974	66	3,553	34	10,527
1945—January	610	67	298	33	908
February	578	67	285	33	863
March	669	67	323	33	992
April	596	65	323	35	919
May	574	64	323	36	897
June	520	66	273	34	793
July	495	68	237	32	732
August	339	68	163	32	502
September	358	72	137	28	495
October	340	70	149	30	489
November	375	73	142	27	517
December	358	72	136	28	494
1945—Total	5,812	68	2,789	32	8,601
1946—January	231	71	95	29	327
February	89	68	41	32	130
March	402	76	128	24	531
April	363	69	165	31	528
May	252	64	141	36	394
June	396	73	148	27	543

Prefabricated Housing Combines Steel and Clay

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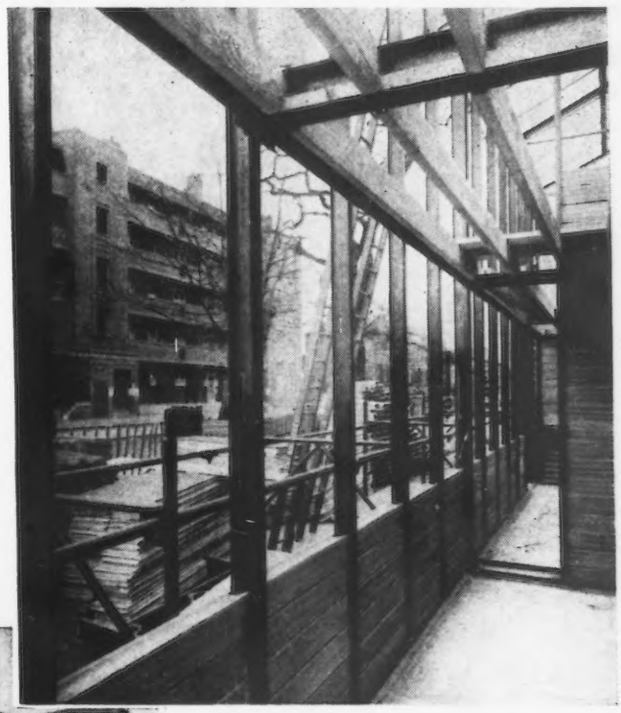
• • • Ingenuity is the keynote in British housing construction where builders are faced with the task of replacing 4,500,000 houses, one out of every three in England. These scenes show construction details of a two-family house which sells for about $13,000 in lots of 250.



• The spaces between upright steel I beams is filled with hollow tile blocks, preformed to size. This combination is then covered with white stucco to form the exterior walls of the Cranwell house, newest of Britain's pre-fabs. (Above)

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• Clay slabs also cover the uprights in this two-family house which is reported to take but three weeks to build from the ground up. Each family unit contains a living room, three bedrooms, kitchen and bath. (Left)

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• Despite its modern aspect, these houses do not have central heating. They will have a coke fire in the living room and electric heaters in the bedroom walls. It is claimed that the staircase, which arrives complete, can be installed in 15 min.

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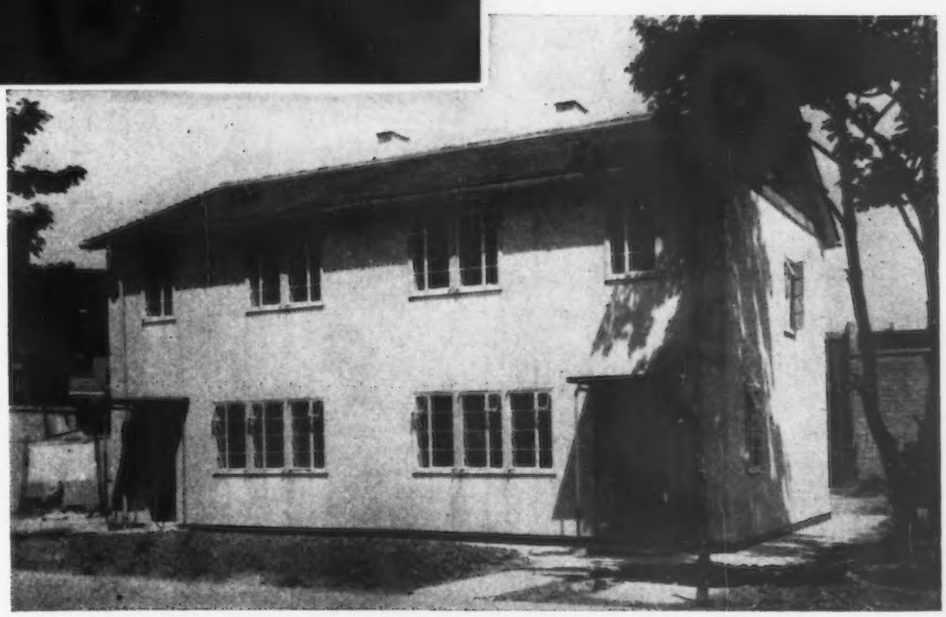

Lack of Concrete Reinforcing Bars Seen Threatening Construction Plans

Pittsburgh

• • • **With many steel** companies cutting their shipments of concrete bars to warehouses and distributors to unprecedented low levels, the fear is growing that important construction work plans will suffer. One major warehouse interest has expressed the belief that a real crisis in certain types of construction such as roads, factory buildings, as well as utility projects is definitely in the making.

As is the case with the shortage of other types of steel items, the dearth of concrete bar tonnage can be laid at the door of the current steel price problem. Steel companies will refuse to divert any unusual or even substantial tonnage of steel to concrete bars as long as the return for using that steel on other products is larger.

It is also apparent, according to some sources, that the question of freight absorption and the emergence of brand new market policies also are responsible for the change in selling practices for concrete reinforcing bars. But some former recipients of much larger quantities of reinforcing bars profess to see an attempt of some steelmakers to take over the market direct from distributors.

This, it is argued, results from the better price which the steel company can get in that the regular trade discounts are bypassed. In almost every case of so-called hardship the steel companies in many cases decide the issue entirely on whether the item involved is a low return product. If it is, it is decided to divert available steel to other products.

So wide has the search for concrete bars been in some instances, that regular hotrolled bars with a greater base price and extra system have been purchased and used on urgent jobs. No amount of pleas on the part of warehouse interests has produced higher quotas; in fact, currently old quotas are being slashed and in some cases being entirely eliminated for the time being at least.

Summary of Production of Iron and Steel Products

• • • **The data presented here was compiled by the American Iron & Steel Institute and will appear in the institute's Annual Statistical Report for 1945. All figures are in net tons.**

PRODUCT	1945	1944	1943	1942	1941
Pig Iron:					
Basic	39,866,982	45,886,008	45,374,662	43,532,865	39,759,841
Bessemer	8,255,513	9,756,836	10,258,788	9,865,220	9,522,343
Low phosphorus	314,063	474,686	538,832	562,672	474,428
Foundry	2,248,887	2,190,681	2,059,501	2,546,530	2,760,827
Malleable	2,350,076	2,494,659	2,393,241	2,399,520	2,417,137
Forge or mill					1,074
All other	187,648	204,569	185,646	169,137	164,901
Total	53,223,169	61,007,439	60,810,670	59,075,944	55,100,551
Ferro-Alloys:					
Ferro-manganese and spiegel	706,078	809,638	803,623	785,103	730,009
Ferro-silicon	817,849	837,944	923,450	880,843	729,716
All other	171,933	211,177	232,204	161,414	126,328
Total	1,695,860	1,858,759	1,959,277	1,827,360	1,586,053
Total Pig Iron and Ferro-Alloys	54,919,029	62,866,198	62,769,947	60,903,304	56,686,604
Steel (ingots and steel for castings):					
Openhearth—basic	71,069,876	79,168,294	77,217,870	75,183,065	73,312,851
Openhearth—acid	869,726	1,195,659	1,413,934	1,318,892	1,076,768
Bessemer	4,305,318	5,039,923	5,621,492	5,553,424	5,578,071
Electric	3,456,704	4,237,699	4,589,070	3,974,540	2,869,256
Crucible	24	25	146	2,010	2,313
Total Steel	79,701,648	89,641,600	88,836,512	86,031,931	82,839,259
Finished Hot-Rolled Products					
Plates—universal	1,228,676	1,676,100	1,603,247	1,825,372	1,265,964
Plates—sheared	6,017,212	11,447,323	11,515,693	9,974,228	4,933,611
Sheets—hot-rolled	12,067,487	10,339,080	9,403,002	9,199,273	13,602,685
Strip	2,542,935	2,593,107	2,125,221	1,901,153	2,540,074
Strip and sheets for cold reduced black plate and tinplate	4,436,924	4,177,865	2,982,379	3,281,860	4,328,111
Hoops	51,891	68,596	60,884	93,071	108,722
Cotton ties and baling bands	34,216	35,892	46,212	54,895	44,461
Black plate	941	556	21,098	238,199	490,811
Total	26,380,282	30,338,519	27,757,736	26,568,051	27,314,439
Bars—merchant	9,649,412	10,532,250	11,383,501	10,110,222	9,143,455
Bars—concrete reinforcement	834,806	628,944	474,546	1,829,760	1,835,243
Total	10,484,218	11,161,194	11,858,047	11,939,982	10,978,698
Structural shapes—heavy	3,571,683	3,824,106	*3,869,736	4,944,670	4,670,782
Structural shapes—light	895,481	852,375	*706,108	871,651	1,053,454
Steel piling	188,639	128,879	36,970	152,688	209,183
Rails	2,417,520	2,490,656	2,125,996	2,096,153	1,927,851
Splice bars and tie plate bars	856,638	862,383	*697,766	745,150	742,382
Skelp	2,894,023	3,049,682	3,022,398	2,900,741	3,637,574
Blanks or pierced billets	3,384,489	3,677,631	*3,356,829	3,039,174	2,945,921
Wire rods	4,531,157	4,646,298	4,693,798	4,632,017	5,268,423
Rolled forging billets	3,566,697	3,762,575	3,796,931	2,881,687	1,769,816
Blooms, billets, etc., for export	178,600	468,088	825,966	1,194,636	1,158,519
Car wheels (rolled steel)	291,375	291,529	233,915	234,794	269,911
All other	170,867	250,064	309,477	244,514	377,234
Total Hot-Rolled Products	59,811,669	65,803,979	63,292,673	62,445,914	62,324,187

* Revised.

Orders Alien Claims Filed

Washington

• • • **Notices of claim** for return of any alien property or interest seized by the United States must be filed within 2 yr from date of seizure or Aug. 8, 1946, whichever date is later, according to James E. Markham, Alien Property Custodian. This deadline was set under authority of Public Law 671, 79th Congress, recently signed by President Truman.

While APC has not set any deadline for filing of debt claims against owners of the seized property, Order 21 by the agency does provide that no bar date prior to Dec. 1, 1946, will be established.

TC&I to Use Diesels

Birmingham

• • • **The Tennessee Coal,** Iron & Railroad Co., U. S. Steel's southern subsidiary, has initiated a program to substitute diesel-electric locomotives for the steam powered locomotives now employed in its Rail Transportation Department. These locomotives are to be operated in switching freight traffic between TCI's plants and mines.

Eight U. S. Agencies Combine In Attack on Nation's Car Shortage

Washington

• • • **Following a series** of conferences at the White House, at which it was revealed that the nation's transportation system is heading into its October seasonal peak faced by a shortage of 100,000 freight cars, OWMR Director John R. Steelman has announced that a concerted effort would be made on the part of eight government agencies to avert a threatened crisis.

Unless it is broken, the threatened freight bottleneck will be a serious blow to the iron and steel industry, CPA Administrator John D. Small indicated. He said that the car shortage is already menacing the steel and coal industries—particularly coal for malleable and gray iron castings. In the Chicago area, he added, movement of finished steel is behind schedule, forcing some mills and blast furnaces to close.

Mr. Small announced that CPA has taken immediate steps to carry out its part of the program, which calls for the repair of 80,000 old cars and the completion of 40,000 new cars in 1946. In addition to channeling steel and pig iron to brake shoe foundries and rendering assistance in getting materials for freight car repair, he said, CPA has requested steel and lumber industries to give close attention to the needs of car builders.

Railroads estimate that they are short 100,000 cars and 80,000 are out of service for repair. Insufficient supplies of steel, Mr. Small said, resulted in a July production of only 4000 freight cars against the CPA goal of 8000. At the end of July, carbuilders had a domestic order backlog of 53,000.

Freight traffic has now exceeded wartime levels and CPA anticipates even more goods shipped during the last half of 1946.

The other agencies involved are the State and Agriculture Depts., the Offices of Price Administration and Defense Transportation, the War Shipping Administration, the Maritime Commission and the National Housing Agency. Steps to be taken by each are:

WSA and the Maritime Commission will place more ships in coastal and intercoastal routes, wherever feasible diverting cross country freight from the rails.

The State Dept. will seek prompt placement of foreign orders, hoping thereby to create a backlog to encourage production.

ODT and the Dept. of Agriculture will take joint steps to speed agricultural and coal shipping and unloadings. ODT will seek to decrease turn-around time by prompter unloadings; it will tighten its less-than-carload regulations.

ODT Director J. Monroe Johnson said that before mid-October there will be a demand for 1 million carloadings weekly. For the first half of August, he added, loadings averaged 32,000 cars a week heavier than the same period in 1945.

Asks Pipeline Expansion

Washington

• • • **Northern Natural** Gas Co. of Omaha, Neb., has applied to the FPC for authority to make expansions costing more than $12 million to its pipeline system running from Texas through Oklahoma, Kansas, Nebraska, Iowa, Minnesota and South Dakota.

Additions planned include two new compressor stations, additions to 12 others, and the laying of approximately 185 miles of 16- to 24-inch pipeline.

Sells Surplus Ship Items

Washington

• • • **Approximately** $685,000 worth of surplus ship materials, including electrical materials, studs, tees, valves, ells, pipes, couplings, nipples, cables bolts, screws and bushings, have been sold to the Sun Shipbuilding & Dry Dock Co. of Chester, the Maritime Commission has announced. The lot represented leftover items at the termination of the Commission's construction program at that yard.

OPENHEARTH USES OXYGEN: *Increased steel production through the use of oxygen in the fuel is seen as a possibility as a result of large scale tests being conducted in a 150-ton openhearth furnace at the Hamilton, Ont., plant of the Steel Co. of Canada. Oxygen was introduced into the furnace in a manner to produce a controlled flame which was directed at the furnace charge during the meltdown period. It was reported that no apparent effect on the furnace lining was noted. These tests have indicated that scrap melting time can be substantially reduced and production correspondingly increased with no further expenditure for additional capital equipment. Among those active in conducting these tests, shown in the accompanying photo, are Gorden Allen, G. V. Slottman, manager, technical sales division, Air Reduction Co., Clark Elliott, E. T. W. Bailey, combustion engineer, Steel Co. of Canada, F. G. Kerry, manager, development and engineering department, Canadian Liquid Air Co., Ltd., and Walter Stayuna.*

Expected OPA Ruling May Require Output Gain of 15 Pct. for Price Relief

Washington

• • • **OPA is considering** a supplementary regulation which would require an industry to prove that it can increase its production 15 pct in 6 months to qualify for price increases that will reflect 1940 profits as required by the new price control law. Under this regulation, an industry would also have to prove that its profits are not "reasonable" to qualify for any price relief whatsoever.

The regulation, expected to be issued soon, will be as rigid as the decontrol procedures announced on Aug. 23. It is now being discussed with various industry groups.

The preliminary draft of the regulation indicates that OPA will insist on applications for price adjustments on individual major products.

The new section 6 of the price control act provides that upon application by the appropriate industry advisory committee, maximum prices may be increased when they fail to cover the 1940 average price of a product plus the industry-wide average cost increase since then. These applications, the law states, must be accompanied by "comprehensive evidence with respect to costs and prices."

The proposed order calls for the following information: (1) A description of the product, (2) the amount of increase applied for, (3) a statement as to which of the pricing methods was used to determine the amount of adjustment—with computations showing that a lower price is not applicable under one of the other methods, (4) facts showing whether the output and use of the product can be substantially increased, at least 15 pct, without curtailing the production of another product at least equally needed, and (5) cost and profit information taken from the books and records of each of the firms selected as a sample of the industry.

The procedures require industry advisory committees to furnish information showing the 1940 average product cost and price and the industry overall profit. There must be also sufficient information to judge what is a reasonable profit for the product and what adjustments should be made for temporary cost abnormalities and anticipated increases in volume.

Where an applicant committee claims that a substantial increase in production is practicable without curtailing the supply of goods at least equally needed, supporting information must be filed.

The order explains how the required data are to be used in computing the amount of price increase available under the law. Sufficient detail is included so industry advisory committees in many cases may be able to apply the standards set forth in the law and compute the amount of increase to be requested without assistance of OPA.

Provision is made for advance approval by OPA, upon request by committees, as to some items that might otherwise be uncertain in the committees' deliberations. These include such items as (1) the committee's understanding as to what is a product for purposes of the law (a general definition is given in the supplementary order), (2) what is a proper industry sample for purpose of necessary cost and price surveys, and (3) whether there are exceptional conditions that would warrant special methods of computation in particular instances. Advance approval may be given by OPA on other matters wherever appropriate.

Two methods are set forth for determining what is a "reasonable profit": (1) the aggregate 1939 operating profit for the particular product, adjusted by one-half the percentage change in volume since that time; or a simpler method (2) one-half the average 1936-1939 industry overall percentage of operating profit on sales.

Coming Events

Sept. 10-14 American Chemical Society, exposition, Chicago.

Sept. 11-12 Society of Automotive Engineers, national tractor meeting, Milwaukee.

Sept. 16-20 Instrument Society of America, first conference and exhibit, Pittsburgh.

Oct. 1-4 Assn. of Iron & Steel Engineers, Iron & Steel Exposition, Cleveland Public Auditorium, Cleveland.

Oct. 3-4 Magnesium Assn. of America, New York.

Oct. 3-5 National Electronic Conference, Chicago.

Oct. 3-5 Society of Automotive Engineers, aeronautic meeting and display, Los Angeles.

Oct. 9-11 Porcelain Enamel Institute, University of Illinois.

Oct. 10-12 American Society of Tool Engineers, semi-annual convention, Pittsburgh.

Oct. 16-19 Electrochemical Society, fall congress, Toronto.

Oct. 23-26 National Tool & Die Manufacturers Assn., convention, Chicago.

Oct. 28 American Institute of Steel Construction, annual convention, Coronado, Calif.

Oct. 28-30 American Gear Manufacturers Assn., semi-annual meeting, Chicago.

Oct. 29-Nov. 1. Refrigerator Equipment Manufacturers Assn., exposition, Cleveland.

Nov. 7-8 National Founders Assn., New York.

Nov. 17-22 American Welding Society, annual meeting, Atlantic City, N. J.

Nov. 18-22 National Metal Congress and Exposition, Atlantic City, N. J.

The London ECONOMIST

The Cleavage Widens

Reprinted by special permission to further understanding on how political and economic affairs are viewed in London.

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LAST week the Paris Conference suddenly turned from squabbles over procedure to a grave ideological dispute. The dispute developed during the debate over statements made by the delegates of the ex-satellite countries, in which the divisions between Allies and ex-enemies became rather blurred. Every speech made it more and more clear how strongly the newer division between the blocs was superimposing itself upon wartime alignments. Antagonism between the Western Powers and Italy appeared to be overshadowed by the common Western animosity towards postwar Yugoslovia. Similarly, Mr. Molotov and Mr. Vyshinsky had many more friendly words to say about Bulgaria or Rumania than about Greece. The Conference witnessed a quite unusual spectacle when ex-enemy Bulgaria appeared before it to make a territorial claim on one of the victorious Allies—Greece—and to demand access to the Aegean Sea.

The stakes in this new diplomatic battle are the future of the Balkan countries, their regimes and their relations with the great Powers. Mr. Molotov defended the present outlook of the Danubian countries, with their quasi-socialist regimes, with the prevalence of Communists in their governments, and their almost exclusive links with Russia. He acted, however, on the principle that attack is the best form of defense. And so, by launching attack against the policy of the Western Powers in Italy, he appeared to defend the present Soviet position in the Danubian Basin. His argument was mainly ideological. The draft treaty with Italy is to include a provision that the Italian Government should grant the United Nations and their nationals "equality of economic opportunity" during the 18 months after the signing of the treaty. This principle became the main target of Mr. Molotov's criticisms. Such equality—he argued—inevitably favored the strong Powers—"those that enriched themselves during the war"—and spelled economic enslavement to the weak. His argument was neither new nor really shocking. It was drawn from the textbooks of socialist economics, from the stock arguments of socialism against free trade.

The ideological nature of the argument is seen even more clearly when it is analyzed in conjunction with the actual text of the draft treaty. All the draft treaties contain the following provision: " The nationals of any of the United Nations shall be granted national and most-favored-nation treatment in all matters pertaining to commerce, industry, shipping and other forms of business activity." The Soviet delegation proposed the following addition to this paragraph in each of the five treaties: "Excluding certain branches where, in accordance with internal legislation in the country, private enterprise does not take part." Alternative clauses proposed by the Western Powers agree to the exclusion of such business activities which are a state monopoly in a given country, but insist that "nevertheless the most-favored-nation principle shall be observed in any such cases in which foreign participation is allowed."

MR. Molotov criticized the application of these principles to Italy, though Russia's interest in the economic clauses of the Italian treaty, is, apart from reparations, negligible. It is known, for instance, that, acting on principles embodied in the draft treaty, the Italian Government has already offered the Soviet Government "opportunities" in Italian civil aviation equal to those offered to the Western Powers; but it is more than doubtful whether the Soviet Government is capable of availing itself of such opportunities. But Mr. Molotov's motive in criticizing the principle was to prevent its application to the Danubian countries. He apparently believed that the present regimes in the Balkan countries are incompatible with free trade, which, consequently, would gravely endanger Russia's influence in the Danube Basin. In order to safeguard Russia's particular interests there, he attempted to discredit the general application of free trade principles, even beyond the Balkans. This was presumably also his motive when he protested against the attempts made by "some Powers" to establish a monopolistic position in the Mediterranean and to reduce France and Italy to minor roles. In fact, this accusation was an implied plea for Soviet monopoly on the Danube.

On the whole he delivered his attack in a cautious and somewhat hesitating manner, pin-pricking "some Powers" and refraining from dotting the i's all the time. The riposte which he thus provoked was much stronger and blunter. For Mr. Byrnes' answer was that, in opposing the free trade clauses in the draft treaties, Russia was merely stepping into Germany's shoes in attempting the economic enslavement of the Balkan countries. "Would anyone suggest"—argued Mr. Byrnes—"that ex-enemy countries, which were the principle object of Germany's economic penetration and encirclement, should continue under the same system of economic relations—but that they should merely substitute for Germany some other country upon which they would be almost entirely dependent for supplies and for markets? It is out of such arrangements and not out of non-discriminatory trade, that enslavement and exploitation arise. The United States cannot remain indifferent to arrangements under

(CONTINUED ON PAGE 130)

Shortages Cause Run on Commercial Loans by Small Plants

Chicago

By D. I. BROWN
Chicago Regional Editor

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• • • **Unable to secure** the necessary raw materials with which to sustain production, many small plants contending with large unbalanced inventories, too few sales, higher costs and a constant fixed overhead, are finding that mere shortages have changed into a question of survival. With industrial and commercial loan demand at an all time recent high, lending institutions are forced to closer scrutiny and are becoming increasingly selective. Small manufacturers, particularly those warborn and those whose products don't justify priorities, face an immediate future of very trying proportions.

DeWitt Emery, president of the National Small Businessmen's Assn., said, "A lot of small manufacturers, just aren't going to make the grade." He went on to explain, "The reason for this is that they do not have enough fat to live on during the extra time granted OPA, which makes it next to impossible for them to get materials in sufficient volume and prevents them from securing a fair price for their product."

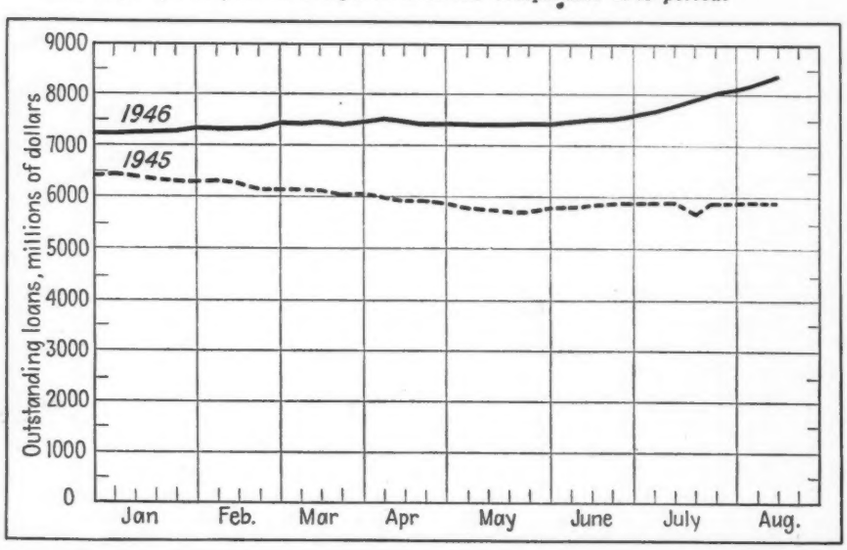
Production, as practiced in this country, requires ample amounts of raw materials and parts. This is true, not only of large corporations, but smaller companies such as those employing 500 people or less, with which Mr. Emery is associated. A shortage, of even one type of item can reduce a plant's output of finished goods to a trickle. Recently the makers of farm equipment cited the quantities of tractors held up on production lines because radiators could not be had. Manufacturers of electrical motors have been stalled for lack of sufficient electrical sheets and copper wire. The best, and most widely advertised example, has been the huge assembly lines of the automotive industry, whose production is far short of the potential capacity for lack of hundreds of component parts. Industry has been using all its ingenuity to make substitutions wherever possible. However, it is so often found that the possible substitutes are just as scarce as the regular materials and so much more expensive as to preclude their use.

All industries are experiencing to some degree these shortages, which are both real and artificial. Real, inasmuch as there just isn't enough material to go around, and artificial in that many plants cannot get their share. A case of artificial shortage is the failure of a plant to qualify priority-wise, because the product is not considered critical or the plant needing material did not formerly buy such items and cannot therefore get on the producers books.

Lately, banks have been called on to make many more short-term commercial and industrial loans to tide industry over what amounts to the end of the reconversion period. Physically, reconversion of plants has been completed but financially, the conversion has not been finished. Failure to get production into high gear has prolonged financial reconversion. William G. F. Price, vice-president American National Bank & Trust Co., has summarized conditons as follows: "The volume of commercial, industrial and agricultural loans made by the banks has been on a steady increase for the past year and a half, the increase being about 40 pct. How much of this increase has been caused by unbalanced inventories resulting from 'bottlenecks,' it is difficult to say. The banking figures are not set up on a basis which makes conclusions of this sort possible." Mr. Price went on to say, "Most banks which have anv volume of industrial business will agree that some part of the growth has been due to this situation."

Mr. Price added that, "The financing of unbalanced inventories by the banks up to the present time has not presented too difficult a problem. The bankruptcy figures published by Dun and Bradstreet, Inc., have not up to now shown any tendency to increase insofar as the number of failures is concerned. There has been some increase in the amount of dollars involved. If severe bottlenecks persist for an extended period of time, it would seem probable that both the number of failures and the amount of liability involved would go up to some extent. However, businesses generally entered the reconversion period with greatly strengthened liquidity, working capital and net worth, and American businessmen have always shown great ingenuity in solving their problems." U. S. Dept. of Commerce reports inventories held by manufacturers increased more than $600 million in

LOANS RISE: *Commercial, industrial and agricultural loans made per month are shown by the chart below. Note sharp rise in loans toward the end of the first 6 months of this year as compared with the comparable* 1945 *period.*



July alone. This is the sharpest rise on record.

Banks, so far, have considered unfinished goods and other inventories a good risk and have gone along but lenders will eventually reach the expendable limit. Applications for new loans are being very closely investigated and borrowers must show a willingness to decrease their fixed overhead charges. Idle or not wholly used manpower, cannot just be laid off in today's market and rehired when materials are again available. Banks consider a plant's production personnel as an asset and have not requested that borrowers cut their labor forces.

Some idea of the loan trend is apparent from the fact that in 1945 industrial concerns raised more money than in any year since 1930. So far this year corporate offerings for new capital have been at an even higher annual rate than 1945. Since May 1945 commercial bank loans have increased and in the last 7 or 8 weeks have shot up sharply.

Walter A. Hoadley, Jr. industrial economist of the research and statistic department, of the Seventh Federal Reserve System, states that the situation certainly justifies study, and that plans are under way to compile the breakdown information within the next month. Part of the investigation will specifically cover the factors underlying the demands of recent bank loan trends which Mr. Price stated were not yet available.

Loan statistics of commercial banks in 101 cities reporting to the Federal Reserve show the recent commercial and industrial loan increase and is the basis of the accompanying chart. Although the figures include agricultural loans, it is the experience of the banks that the majority of short term loans are to small manufacturers, many of them in the metalworking field, and are to cover the present emergency which has been caused by high prices, unbalanced inventories, and comparatively few sales. The figures comparing the first 6 months of 1945 to 1946 are used so that the seasonal loans would not be too much of a variable. The increase also reflects loans made to new businesses, which up to this year did not have sufficient records or operating experience to heretofore qualify.

It is obvious that industrial enterprises must be fed either by sufficient raw materials or loaned cash if they are to remain solvent. Larger corporations are reported as not being in such bad shape as their operating losses have been somewhat offset by tax refunds. Ready cash by lending institutions is becoming tighter and a real shortage in this commodity is entirely possible. Shortages in ready money can only be offset by increased production of the manuacturing plants. Banks are not as interested in long term credit as they have been and for the most part are making short term loans.

It is reported that leading bankers are following the situation closely, and that their future action will be greatly influenced by the survey being made by the statisticians of the Federal Reserve System, which will precisely analyze not only past loans, but future possibilities. Up until now failures of small businesses have not occurred but as Mr. Emery points out they are in the making. It is the opinion of all business executives interviewed that sustained high production of goods is the essential and natural remedy. The question is, can bank credit be stretched far enough to cover all those needing help and long enough for full production to take hold?

SUMMARY OF UNITED KINGDOM STEEL STATISTICS

Source: British Iron & Steel Federation

All Figures Thousands of Net Tons	STEEL			PIG IRON	SCRAP	IRON ORE	
	Ingots and Castings	Finished Deliveries	Steel Stocks (1)	Production (2)	Steelmaking Consumption	Imported Ore Consumption	Home Production
1944 Total	13599.0	11502.4	2431.5	7542.0	8252.6	2725.6	17332.2
1945 Total	13237.8	9992.3	1885.9	7959.4	8065.9	4494.7	15870.4
1945 June	1067.5	835.0	1566.9	595.8	680.5	307.7	1289.3
July	956.9	695.3	1475.4	603.9	597.1	347.2	1228.8
August	1041.0	796.8	1434.4	701.1	619.3	436.2	1239.2
September	1077.8	792.5	1415.4	624.9	650.0	438.1	1102.5
October	1360.8	932.4	1356.8	818.1	818.1	595.2	1385.4
November	1106.1	803.7	1358.0	672.0	659.9	467.7	1115.5
December	992.3	735.6	1332.4	651.8	592.7	449.7	1036.6
1946 January	1025.0	971.0	1370.9	803.6	754.8	541.5	1373.6
February	1107.5	833.2	1341.5	654.5	657.2	445.8	1147.3
March	1145.5	898.6	1314.7	659.9	695.2	484.2	1148.6
April	1129.4	827.0	1265.1	666.1	682.7	499.0*	1090.8
May	1466.0	1139.0	1283.6*	846.7	890.9*	644.5	1371.4
June	1074.3	859.2	1267.6	678.7	628.9	531.7	1010.2

[1] Held by producers and in British Iron & Steel Corp. stockyards at the beginning of the year and months shown.
[2] All qualities, including ferroalloys.
* Revised.

Industrial Briefs . . .

• COLD METAL EXPANDS—Cold Metal Products Co., Youngstown, Ohio, has in process an expansion program which will increase its capacity from four to six Steckel 4-high reversing cold mills, and additional annealing and slitting capacity. Two new cold rolling mills which will roll steel up to 28-in. widths are now under construction. One of the new mills will be ready to test and put into production in the near future, according to company officials. The other will be ready in about two months.

• CHANGE OF ADDRESS—Wickwire Spencer Steel, division of the Colorado Fuel & Iron Corp., has moved its general sales manager's office from 500 Fifth Ave., New York, to 361 Delaware Ave., Buffalo.

• GE BUYS HANFORD WORKS—General Electric Co's. Pittsfield chemical dept. on Sept. 1 assumed management of the government - owned $347,000,000 Hanford Engineering Works, Ruchland, Washington, atomic energy project now operated by the E. I. Du Pont de Nemours Co. Administrator of the Hanford works will be William H. Milton, Jr., assistant general manager of the Pittsfield chemical dept., while David H. Lauder, assistant manager of General Electric's Schenectady engineering div. will be plant manager.

• SUBMITS BID—T. I. Phillips, vice-president of the Westinghouse Electric Corp., disclosed negotiations are under way for acquisition of the former Curtis Wright Corp. plant in Vanport, Beaver County, Pa., to provide manufacturing facilities needed by the company's small "de-ion" circuit breaker dept.

• NATIONAL CAN EXPANDS—National Can Corp. has bought the entire capital stock of the Union Plate & Wire Co., Attleboro, Mass. The Attleboro company plates precious metals. Its present organization will be continued.

• SMALL CAR PLANT — The Bobbi-Kar Corp., San Diego, Calif., has taken a 5-yr lease on approximately 700,000 sq ft of floor space at a plant in Birmingham formerly used by Bechtel-McCone Corp. as an airplane modification center and will use the space for the manufacture of a small, new car. Corporation officials said the company was capitalized at $12,500,000 and that a daily output of 800 cars was planned when full production got under way. S. A. Williams, company president, said he expected 10,000 to 12,000 persons to be employed when peak production is reached. First shipments of manufacturing machinery are scheduled to arrive within 30 days.

• NEW FOUNDRY—Pick Industries, Inc., West Bend, Wis., is building a new plant to be used for foundry operations.

• CONTRACT AWARD — Forter-Teichamann International, a subsidiary of Loftus Engineering Corp., has been awarded a contract for completely engineering, furnishing, and placing in operation plants for the Syrian Glass and Porcelain Industries of Damascus, Syria. Over one million dollars is involved in the program for the production of window glass, rolled sheet glass, bottles and other glass products.

• REORGANIZES—Reorganization of the Torq Electric Mfg. Co. and Torq Properties, Inc. under corporate name of the Torq Electric Corp. was announced by Edward Schweid, legal counsel and director of the company. The company, maker of fractional hp motors, has capitalization of $350,000 consisting of $250,000 in common stock, the balance in preferred stock.

• ACQUISITION — H. K. Porter Co., Inc. announced today the acquisition of the Brake Equipment & Supply Co., Chicago, manufacturers of brake parts for railway locomotives and freight cars, and airbrakes for export.

CPA Will Certify Key Workers for Deferment

Washington

• • • **A minimum number** of key workers in essential reconversion and transportation activities will be certified by CPA for occupational deferment under Selective Service, it has been announced.

Authority of the agency for certification applies only to two classes of registrants, (1) qualified and irreplaceable production workers in critical industries and (2) supervisory, technical or scientific personnel in essential industries.

Critical industries are confined to those making items on CPA's "critical" list and "essential" industries include those designated as basically important to reconversion.

Coke Resale Prices Gain

Washington

• • • **Effective Aug. 23,** OPA has authorized distributors of byproduct and retort gas coke to substitute a percentage pass-on of the June 28 producers' increase ($1.35 a ton) for the specific dollar-and-cent pass-through previously allowed.

At the same time, the price agency authorized producers who make retail sales in less than carload lots at or from their plants to add to their ceiling prices the same amounts allowed retail dealers for similar sales.

Distributors of byproduct coke sold for use in foundry cupola or blast furnaces have been excluded from the new pricing because their March 31 maximum prices did not provide a margin for their sales.

New Regional Director

Cleveland

• • • **The War Assets** Administration has appointed O. E. Thomas Regional Director of the 15th Region, WAA, succeeding S. G. Backman who has been promoted to Administrator with headquarters in Chicago, supervising WAA activities in 11 midwestern states. Mr. Thomas will direct disposal of government owned surplus property in northern Ohio and western Pennsylvania.

Construction Steel...

New York

• • • **Fabricated steel awards** this week included the following:

11,350 Tons, China, 154 railroad bridges, to Bethlehem Steel Co., Bethlehem, Pa.

1650 Tons, State of Iowa, truss and beam spans, Chicago & Northwestern Railroad, to American Bridge Co., Pittsburgh.

310 Tons, Heron, Ill., coal processing plant, Freeman Coal Mining Co., to American Bridge Co., Pittsburgh.

175 Tons, Compton, Calif., Southern California Telephone Co., addition, to Consolidated Steel Corp.

• • • **Fabricated steel inquiries** this week included the following:

1600 Tons, Chicago, warehouse.

1100 Tons, State of New Mexico, bridge A195-B62 for Albuquerque Div. Atchison, Topeka & Santa Fe Railroad.

750 Tons, Fort Bragg, Calif., state highway bridges.

400 Tons, Dallas, Tex., state highway commission bridges.

345 Tons, Chicago, factory building, Atlantic Brass Co.

• • • **Reinforcing bar inquiries** this week included the following:

115 Tons, Los Angeles County, Calif., paving between Latigo Canyon and Malibu Creek, California Div. of Highways, Los Angeles, bids open Sept. 26.

Administrator Small Forecasts Easing Of Iron, Steel Castings

Washington

• • • **An easing of** the tight iron and steel castings situation is forecast for the final quarter of 1946 by CPA Administrator John D. Small in his latest monthly report, issued Aug. 28.

While shipments of both gray and malleable iron castings declined in June and incomplete data indicated little change for July, the prediction was based on the continuing high production of the steel industry.

"With continued steel ingot operations at 90 pct of capacity," Mr. Small said, "demand for iron and steel castings should be more easily met during the remainder of the year."

Although July production of 6.6 million tons of steel ingots was the highest of the year, the report stated, shipments of finished steel products (estimated at about 4.8 million tons) would not exceed those of June This was due largely, it was said, to the freight car shortage and a normal hot weather slump.

With major strikes ended, a sharp climb to 43,600 short tons of domestic refined copper, almost double that in June, was reported. Prestrike January levels of 69,000 tons were forecast for August.

July pig iron production was the highest in a year, it was said, with output of all grades exceeding 4.6 million net tons. Blowing in of a relined furnace in Pennsylvania was expected to help matters.

Despite the optimistic forecast for castings, the report showed a continuing decline in June for both gray and malleable iron, and data for July, as yet incomplete, was expected to show little change. Predicted improvement was based on continued high steel production and high July deliveries of iron to the foundries.

Aluminum sheet mills were reported as producing at the rate of about 75 million lb per month but no increase in this output was anticipated until after a new plant at Davenport, Ia., goes into operation in late 1947.

In the finished products field the heaviest gains in consumer durables were registered in the automotive field, the report noted. Passenger car production rose in July to 220,000, a gain of 56 pct, while 93,000 trucks rolled off the lines for an increase of 58 pct.

Production of sewing machines jumped 30 pct to 35,000 while electric ranges gained 20 pct over the prewar rate to total 57,000. Refrigerator production also rose slightly to 220,000 while washing machine output dropped slightly to 187,000 for the month.

Both gas ranges and electric irons registered a decrease although both continue at above prewar averages, at 57,000 and 502,000 units, respectively.

Improvements were also reported in shipments of builders hardware and cast iron and convector radiation during the month, but production of plumbing fixtures receded for the second consecutive month because of materials difficulties. CPA hopes the inauguration of premium payments will boost cast iron soil pipe output from 29,900 tons in July to at least 34,600 for August.

Urges Repair Orders For Freight Cars Be Kept at 3 Pct Level

Washington

• • • **The nation's** railroads have been urged by Col. J. Monroe Johnson, ODT Director, to redouble their efforts to repair and reduce the number of bad order freight cars.

In letters addressed to key railroad executives, Colonel Johnson asked for definite assurances on the extent to which their present car repair situation can be bettered in the near future. He offered the aid of ODT in expediting deliveries of material such as steel and lumber which may be delaying car repair programs and asked for information on any material bottlenecks that they might have.

Colonel Johnson pointed out that during the war in spite of manpower and other difficulties the national percentage of cars awaiting repair was kept below 3 pct for many months. He called upon the railroads to reduce their bad order cars and to set the 3 pct level as their immediate objective.

ODT figures show the number of cars of all types awaiting repair totaled 82,088 as of Aug. 3, 1946, or 4.7 pct. The number is about double the Nov. 1, 1942 wartime low point figure of 41,608 or 2.4 pct. It was pointed out that the 40,000 increase in the number of bad order cars since the wartime low point is about twice as high as the freight car shortage of 20,615 reported for the week ended Aug. 3.

To Probe Car Shortages

Washington

• • • **A probe of** freight car shortages has been ordered by the ICC in response to a request from the Office of Defense Transportation which asserted that record industrial production is threatened. The ICC has directed that public representations related to the investigation be filed with it in writing by Sept. 30.

MACHINE TOOLS

. . . News and Market Activities

Output Drops; July Sales Hit 1946 Low

Cleveland

• • • **Expectations that** a substantially reduced buying level in the machine tool industry would be reached following the initial retooling of plants after V-J day appear now to be well along toward realization. With many plants equipping themselves from the ample WAA surplus pool, it is not surprising to find that the demand for machine tools is now off from a wartime peak of approximately $1,320 million to $380 million and has attained an annual volume about equal to the 1940 production level. Some segments of the industry expect even lower buying levels may be looked for in the not-too-distant future.

According to the latest report of the National Machine Tool Builders Association, shipments of machine tools during July totaled $22,350,000, setting a new low total for any month during 1946. June shipments aggregated $28,580,000 while the comparable figure for May is $26,580,000. September is expected to make a somewhat better showing than July.

Low shipments during the month of July are accounted for by the continued shortage of parts, with electric motors, bearings and castings being listed as the most critical items at present. Not all segments of the industry have been hit alike by over-stretched supply lines. Several producers of equipment requiring large castings, for example, report that castings deliveries have been surprisingly close to schedule with the result that production levels have been maintained at close to 75 pct of expectancy. On the other hand, other builders have been hard hit by the critical scrap and pig iron shortages which have, in many instances badly upset established foundry practice and resulted in rejects far higher than normal expectancy.

The backlog on machine tool orders is reported to be substantial and at the present rate of shipment should keep machine tool builders operating at existing rates, through the remainder of this year and well into 1947. At the same time, suppliers of machine tools are not ignoring the possible effect of constantly rising production costs, particularly in the automobile industry. While cancellations up to the present time have not been substantial, any important decisions taken by industry to stand by their present models and to resist the impulse to alter or improve existing models will undoubtedly be reflected in future machine tool sales.

As in the case of many other industries, the machine tool industry has had to scramble to maintain production. In a number of instances aluminum castings have been substituted for cast iron and malleable and vica versa and forgings have been assembled by means of welding and substituted for castings. The grim realization that strikes which hit the copper, steel and coal industries months ago may not even yet have visited their full effect on industry has alerted all builders to be ready to make substitutions as soon as bottlenecks develop in their supply lines.

Most machine tool builders have indicated that the adjustments in their operations necessitated by today's smaller demand have now been made and the present hope is that operating rates can be maintained without sustained interruptions resulting from strikes, shortages, cancellations or other unpredictables.

In Cincinnati, present indications are that foreign business is again lagging behind domestic business. Orders are still coming in piecemeal—but foreign buyers are reported to be having trouble obtaining money and import licenses. The huge ordering that was characteristic of the war period has now virtually disappeared and business may be said to be by "fits and starts" rather than in sizable and even predictable amounts. Several producers in the Cincinnati area report substantial increases in shipments during the month of July but the gain should be regarded as temporary and a pre-vacation jump in output rather than as an addition to total business volume.

In Boston, the trade expects some pick-up in sales although it realizes that it is still up against the stiffest kind of competition from the government. August was one of the leanest tool months experienced by tool manufacturers in a long time and one of the quietest on record for used tool houses.

Many tool manufacturers are expanding their export business and are inclined to believe they may have to depend on this type of business rather than domestic until the glut of government surplus equipment has been cleaned up. Faith in the future of the domestic market is by no means lost, however. Virtually every tool maker is working on new equipment or improving old ones. Patents are coming thick and fast and apply to almost every variety of tools. Makers feel that sooner or later users will have to purchase improved equipment if they are to keep up with competition and keep down production costs.

Although no official confirmation is yet available in Detroit, reliable sources have reported that orders for machine tools that were to have been used in building automatic transmissions for Ford have been set back from 10 to 12 months. Vendors, it is reported, were notified by telegram during the past week of the change in the Ford program. Opinion here is that the decision has been prompted by the constantly rising cost of building motor cars and that this is strictly an economy move by Ford to simplify automobile construction and cut production costs. It has been estimated that machine tool orders aggregating several million dollars may be affected by the Ford decision.

In Detroit, inquiries for machine tools have been fairly active, tending upward. However, mostly because of the scarcity of electrical equipment, shipments have fallen considerably below expectations. An appreciable pick-up in the final quarter of this year has been predicted by some segments of the industry.

A Complete Blade Service

The MARVEL System of Metal Sawing provides not only the most advanced and most complete line of metal sawing machines built, but also a complete metal-cutting blade service which includes:

(1st) MARVEL High-Speed-Edge Hack Saw Blades— positively unbreakable, composite blades with a high speed steel cutting edge welded to a tough alloy steel body. Hardened "eyes" permit greater blade tension. Extra strength makes practical greatly increased speeds and feeds—in fact, these blades make possible today's fast automatic hack saw machines.

(2nd) MARVEL High-Speed-Edge Hole Saws— hole saws with strength for use on drill presses and lathes. Diameters from ⅝" to 4½" with high speed steel pilots. Cut big holes at low cost in steel to 1⅛" thick.

(3rd) MARVEL Metal-Cutting Band Saw Blades come ready-welded (endless) and individually boxed. (*Order by make and model of machine and number of teeth per inch.*) MARVEL'S individual boxing prevents damage to teeth, kinking or loss thru rust in shipping, storing or handling. Specify MARVEL Band Saw Blades for top quality and top performance.

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NONFERROUS METALS

. . . News and Market Activities

OPA Closes Door On Lead Price Increase

Washington

• • • **OPA, on Aug. 29,** closed the door on any increase in ceiling prices of lead or lead scrap in the foreseeable future.

In clarifying OPA's policy in regard to OPA's lead pricing policy, OPA Administrator Paul Porter said:

"There has been serious withholding of lead in the mistaken belief that ceiling prices would be raised. Although in the case of lead, a number of sales were made during the interim at a price of 9.5 cents per pound as compared to the ceiling of 8.25 cents per pound, this does not justify an increase in the ceiling. It previously had been made clear that no 'bail out' would be provided for those who bought at over-ceiling prices during the interim."

OPA also said that they have been advised by CPA Chief John D. Small that his agency will move quickly to prevent the building up of excessive inventories of lead.

"CPA's compliance division will check privately owned stocks of ores, concentrates, residues, scrap and secondary and primary lead wherever evidence may exist of the accumulation of stocks in violation of inventory restrictions," he said. "In any such cases, we will take immediate action to force compliance with our inventory regulations."

Substantial price increases for primary lead, secondary lead and lead scrap, OPA pointed out, were granted June 3, 1946. These increases, coupled with the subsidies paid on lead, comply with requirements of the law. Moreover, Reconversion Director John R. Steelman has clarified the Government's subsidy program on domestic and imported metals covering both the interim period when controls were suspended and the future. Nothing in the Price Control Extension Act requires further price adjustments at this time.

"Since the premium price plan takes care of the mining of lead, and since the Reconstruction Finance Corporation is buying obtainable foreign lead and reselling it here at the domestic ceiling price," declared OPA Administrator Paul Porter, "there is no sound reason for a further increase in lead ceiling prices."

•

Lead Further Restricted

Washington

• • • **Due to the shortage** of the lead supply CPA has placed further restrictions on the sale of lead by primary refiners. Under an amendment to M 38 refiners producing soft pig lead must now obtain an authorization from CPA for disposal of any lead not subject to the 25 pct set-aside which has not been sold by the 20th of the month.

•

Silver

Washington

• • • **Effective Aug. 23,** premiums for distributors and resellers of silver have been raised by OPA in order to restore the average March 31 mark-ups as required by the revised Act.

Historically, when the base price of silver was increased on August 1, dealers were permitted only a dollar-and-cent pass-through which cut their mark-ups to below former percentage levels.

At the same time, OPA said resellers of semi-fabricated items such as silver alloys, powder, wire and sheet may determine new maximum prices by adding to the total net cost of the article the amount obtained by multiplying the net cost figure by the March 31 percentage mark-up.

Increases in distributor margins have been applied to each quantity bracket and the resultant figures rounded off. New and former quantity differential premiums for silver resellers are as follows:

Quantities	New in Cents	Old in Cents
100,000 ounces to (not including) 200,000 ounces	0.375	0.25
25,000 ounces up to 100,000 ounces	0.50	0.375
10,000 ounces up to 25,000 ounces	0.625	0.50
5,000 ounces up to 10,000 ounces	1.0	0.75
2,000 ounces up to 5,000 ounces	1.5	1.25
Under 2,000 ounces	2.5	2.0

•

Dutch East Indian Tin

Washington

• • • **Tin production** in the Netherlands is steadily on the increase. Dutch government officials say. Billiton Island is now producing at the rate of 5400 tons annually while the nine mines on the island of Bangka are expected to increase the year's total by 2000 tons. Coal production on Balikpapan and Tarakan has increased from 70 tons daily in March to 250 tons in August.

Monthly Average Prices

New York

• • • **The average prices of the major nonferrous metals in August, based on quotations appearing in** THE IRON AGE, **were as follows:**

	Cents Per Lb.
Electrolytic copper, Conn. Valley	14.375
Lake copper, Conn. Valley	14.375
Straits tin, New York	52.00
Zinc, East St. Louis	8.25
Zinc, New York	8.69
Lead, St. Louis	8.10
Lead, New York	8.25

Nonferrous Metals Prices

Cents per pound

	Aug. 28	Aug. 29	Aug. 30	Aug. 31	Sept.2	Sept. 3
Copper, electro., Conn.	14.375	14.375	14.375	14.375	14.375	14.375
Copper, Lake, Conn.	14.375	14.375	14.375	14.375	14.375	14.375
Tin, Straits, New York	52.00	52.00	52.00	....	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25	8.25	8.25
Lead, St. Louis	8.10	8.10	8.10	8.10	8.10	8.10

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb)	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American, Laredo, Tex.	14.50
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	$14.75
Beryllium aluminum, 5% Be; dollars per lb contained Be	$30.00
Cadmium, del'd	$1.25
Cobalt, 97-99% (per lb)	$1.50 to $1.57
Copper, electro, Conn. Valley	14.375
Copper, electro, New York	14.125
Copper, lake, Conn. Valley	14.375
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz	$ 2.25
Iridium, dollars per troy oz.	$125.00
Lead, St. Louis	8.10
Lead, New York	8.25
Magnesium, 99.9 + %, carlots	20.50
Magnesium, 12-in. sticks, carlots	27.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$99 to $100
Nickel, electro, f.o.b. refinery	35.00
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$33.00
Silver, New York, cents per oz.	90.125
Tin, Straits, New York	52.00
Zinc, East St. Louis	8.25
Zinc, New York	8.69
Zirconium copper, 6 pct Zr, per lb contained Zr	$ 6.00

Remelted Metals

(Cents per lb)

Aluminum, No. 12 Fdy. (No. 2)	12.50 to 12.75
Aluminum, deoxidizing	
No. 2	13.00
No. 3	12.00
No. 4	11.50
Brass ingot—ceiling prices	
85-5-5-5 (No. 115)	15.50
88-10-2 (No. 215)	18.75
80-10-10 (No. 305)	18.25
No. 1 Yellow (No. 405)	12.50

Copper, Copper Base Alloys

(Mill base, cents per lb)

	Extruded shapes	Rods	Sheets
Copper	25.66	....	25.81
Copper, H.R.	....	22.16	....
Copper drawn	....	23.16	....
Low brass, 80%	....	24.35	24.66
High brass	....	....	23.67
Red brass, 85%	....	24.67	24.98
Naval brass	23.34	22.59	28.53
Brass, free cut	....	18.53	....
Commercial, bronze	....	25.50	25.81
Manganese bronze	27.45	25.95	32.03
Phosphor bronze, A, B, 5%	....	43.70	43.45
Muntz metal	23.59	22.34	26.78
Everdur, Herculoy, Olympic or equal	....	29.82	30.88
Nickel silver, 5%	....	34.44	32.38
Architectural bronze	22.50	....	....

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢, 52S-O, 67¢ 24S-T, 71¢: base, 30,000 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢; 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb and over.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb and over.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 27.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢ 1 in., 2 in., 27¢; base, 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18: 2S, 3S, 33.5¢; 56S, 49.5¢; 10,000 lb base; B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢; B & S 15-16: 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

(Continued, See Next Column)

Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb or more, 46¢ a lb; 25 to 90 lb, 56¢; less than 25 lb, 66¢.

NONFERROUS SCRAP METAL QUOTATIONS

†(OPA basic maximum prices, cents per lb., f.o.b. point of shipment, subject to quality, quantity and special preparation premiums—other prices are current quotations)

Copper, Copper Base Alloys

OPA Group 1†

No. 1 wire, No. 1 heavy copper	11.50
No. 1 tinned copper wire, No. 1 tinned heavy copper	11.50
No. 2 wire, mixed heavy copper	10.50
Copper tuyeres	10.50
Light copper	9.50
Copper borings, No. 1	11.50
No. 2 copper borings	10.50
Lead covered copper wire, cable	....*
Lead covered telephone, power cable	....*
Insulated copper	....*

OPA Group 2†

Bell metal	17.25
High grade bronze gears	15.00
High grade bronze solids	....*
Low lead bronze borings	....*
Babbitt lined brass bushings	14.75
High lead bronze solids	....*
High lead bronze borings	....*
Red trolley wheels	12.50
Tinny (phosphor bronze) borings	12.25
Tinny (phosphor bronze) solids	12.25
Copper-nickel solids and borings	11.00
Bronze paper mill wire cloth	11.25
Aluminum bronze solids	10.75
Soft red brass (No. 1 composition)	10.75
Soft red brass borings (No. 1)	10.75*
Gilding metal turnings	10.25
Contaminated gilded metal solids	10.25
Unlined standard red car boxes	10.00
Lined standard red car boxes	9.50
Cocks and faucets	9.50
Mixed brass screens	9.50
Red brass breakage	9.25
Old nickel silver solids	7.60
Old nickel silver borings	7.50
Copper lead solids, borings	6.75
Yellow brass castings	7.50
Automobile radiators	8.75
Zincy bronze solids, borings	9.75

OPA Group 3†

Fired rifle shells	9.50
Brass pipe	8.75
Old rolled brass	8.25
Admiralty condenser tubes	8.75
Muntz metal condenser tubes	8.25
Plated brass sheet, pipe reflectors	7.75
Manganese bronze solids	8.00[1]
Manganese bronze solids	7.00[2]
Manganese bronze borings	7.25

OPA Group 4†

Refinery brass	6.00*

*Price varies with analysis. [1] Lead content 0.00 to 0.40 pct. [2] Lead content 0.41 to 1.00 pct.

Brass Mill Scrap†

Briquetted cartridge brass turnings	10.375
Cartridge brass turnings, loose	9.625
Loose yellow brass trimmings	9.625

Aluminum

Plant scrap, segregated

2S solids	8.50 to 9.00
Dural alloys, solids 14, 17, 18, 24S, 25S	6.00 to 6.25
turnings, dry basis	1.50 to 1.75
Low copper, alloys 51, 52, 61, 63S solids	8.00 to 8.50
turnings, dry basis	5.00 to 6.50

Plant scrap, mixed

Solids	4.25 to 4.50
Turnings, dry basis	1.50 to 1.75

Obsolete scrap

Pure cable	6.50 to 7.50
Old sheet and utensils	5.00 to 5.50
Old castings and forgings	5.00 to 5.50
Pistons, free of struts	4.00 to 4.50
Pistons, with struts	2.50 to 3.00
Old alloy sheet	2.00 to 2.50

Magnesium*

Segregated plant scrap

Pure solids and all other solids, exempt	
Borings and turnings	1.50

Mixed, contaminated plant scrap

Grade 1 solids	3.00
Grade 1 borings and turnings	2.00
Grade 2 solids	2.00
Grade 2 borings and turnings	1.00

*Nominal.

Zinc

New zinc clippings, trimmings	7.50
Engravers, lithographers plates	7.50
Old zinc scrap	5.75
Unsweated zinc dross	6.00
Die cast slab	5.50
New die cast scrap	5.45
Radiator grilles, old and new	4.50
Old die cast scrap	4.00

Lead

Deduct 1.40¢ a lb from refined metal basing point prices for refinery charge on used battery plates.

Soft lead scrap	7.50

Nickel

Ni content 98+%, Cu under ½%, 23¢ per lb; 90 to 98% Ni, 23¢ per lb contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	29.75
Electrodeposited	23.47
Rolled, oval, straight, delivered	23.72
Curved, 18 in. or longer, delivered	23.72
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	27.25
Zinc, cast, 99.99, 15 in. or longer	17½
Nickel, 99 pct plus, frt allowed	
Cast	47
Rolled, depolarized	48
Silver, 999 fine	
Rolled, 100 oz. lots, per oz.	95⅞

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 1-5 bbls	34.00
Copper sulphate, 99.5, crystals, bbls	7.75
Nickel salts, single, 425 lb bbls, frt allowed	13.50
Silver cyanide, 100 oz lots, per oz.	0.749
Sodium cyanide, 96 pct, domestic, 125 lb drums	15.00
Zinc cyanide, 100 lb drums	33.00
Zinc sulphate, 89 pct, crystals, bbls, frt allowed	6.35

SCRAP

Industry Awaits Action on Price Increase

New York

• • • **Latest reports** on the scrap price front indicate that the increase recommended by the Scrap Industry Advisory Committee of the OPA met with some resistance on the part of the higher policy-making executives of the price agency. It is reported, however, that OPA is well aware of the slowdown in shipments caused by information in the trade to the effect that the committee had recommended an increase. It is therefore believed that a statement can be expected soon from the OPA.

The committee action in New York on Aug. 28 had the effect of still further reducing shipments to the nation's steel mills last week though some material continued to move because of the added costs involved in withholding it in the yards with its consequent double handling cost.

A report of the OPA Scrap Industry Advisory Committee meeting of Aug. 28 appears on p. 100 of this issue.

Bartering and similar unusual deals are reported to be on the increase as mills and foundries struggle desperately to operate. At that, many mills are running on a hand to mouth basis and the plight of foundries is said to be even worse.

While most of the steel deals are quite legal they are causing a dislocation of normal markets. In the cast grades black market activities appear to be on the increase with good melting metal harder to get than new cars.

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PITTSBURGH—While scrap interests awaited later price developments the movement of scrap in the past week has slowed down to such a low point that some wags are quibbling over the definition of "stopped." No full and normal flow of material is possible here until the price situation is settled once and for all by OPA. Should the price increase be allowed this week it is expected that the flow of scrap from yards will be quite substantial—at least enough to allay fears of a shortage for a few months at least.

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CHICAGO—Mills are getting sufficient scrap to keep going but inventories are so low that if the flow were doubled their anxieties would still persist. Straight sales through ordinary channels are still taking place but some mills and sellers have been forced to barter and exchange in a multi-facet system with all kinds of angles. There are those who believe that should the present trend continue, the scrap industry may degenerate to a series of consecutive, complicated deals, where the primary medium of exchange will not be money but finished steel products and scrap metal. Shipments from the West have stopped and the special freight rate was allowed to lapse as the sources dried up or were needed for consumption on the coast. Qualities of the different grades have not improved and OPA inspectors are holding up many cars.

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PHILADELPHIA — About the only scrap that moved following the report that the OPA Scrap Industry Advisory Committee had voted for a price rise was industrial scrap which had to be moved to save double handling costs. Cast iron grades are almost impossible to find, dealers report. Price action is not expected to have much effect on cast scrap because of its critical scarcity. While some sales of steel grades were made, shipment was withheld pending the OPA price announcement.

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DETROIT—The Detroit scrap market has been very quiet during the past week pending announcement of price action to be taken by OPA. Dealers in particular are inclined to sit tight until the price problem is settled temporarily at least and only materials called for under contract are reported to be moving in volume. New lists out this week indicate there is some increase in the volume of industrial scrap being generated but practically all of this material moves under directives, even from small plants. Meanwhile, the number of steel salesmen in this area who are presently functioning as scrap solicitors increases almost daily.

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BOSTON—Bids for recently offered Navy Yard scrap were: No. 1 steel $16.37 a ton; No. 2 steel $16.27; unprepared $14.28 and light iron $11.25. In view of possible OPA price revisions, the Navy Yard is undecided about making an award. Low phos plate, turnings and bundling material at ceilings are rolling, but trade in general is moving little. Certain small yards may soon have to sell or discontinue collections. August yard accumulations in general were not substantial.

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NEW YORK—Shipments during the past week fell further. The only thing that kept them from drying up following the meeting last Wednesday was industrial scrap and the larger dealers who continued to move metal on the theory that any price increase would hardly justify the increased handling costs involved in withholding it. Considerable proportions of genuine low phos (as opposed to what is often sold as "low phos") are said to be moving to steel mills for openhearth use, leaving the electric furnace producers in rather a bad spot. Cast iron scrap is extremely tight here with some sales reported at $30 a ton. Observers doubt that higher prices will bring out much cast unless the junkie can see a chance to make a living out of it.

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CINCINNATI—Interests in this district are showing considerable anxiety about the remote possibilities of building a reserve for the winter months. Most of them report that stock piles are sufficient for them to continue on a hand-to-mouth basis, But there is none of the building for winter time that is usually well under way by this time. Scrap dealers and brokers could give no encouragement about the increase in availability. Some sources indicated that they are having to trade steel for scrap. Although one of the more important interests in this area reports that they are allotting their steel to their customers in quantities similar to that of pre-war ordering.

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BIRMINGHAM—The holding back of scrap pending price action by the OPA continues to harass mill operators in this area. Plants producing scrap are keeping it in anticipation of being allowed higher prices and dealers are operating on the same assumption. Except for railroad scrap, the quality of the little material available is pretty much on the light side.

•

BUFFALO—Dealer shipments were almost entirely halted late last week by the confusion over what would come of the OPA Advisory Committee meeting in New York. Leading consumers recently have been able to avoid inventory losses by heavy use of hot iron, although there has been no improvement in receipts. One steel producer whose requirements are exacting reports unusually high rejections of scrap from miscellaneous sources because of alloy content. Each carload received at this plant is stripped before analysis as an added precaution against spoiled heats.

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CLEVELAND—Steel mills in this area continue to operate on their nerve while waiting for the OPA announcement. Shipments of industrial scrap have been off somewhat during the waiting period of the past few weeks but it is anticipated that scrap flow will pick up noticeably following a definite decision on scrap prices. At the same time, there are few indications that scrap is being held in yards in large volume and mills will undoubtedly have to continue to live with their present "uncomfortabe" scrap piles for some time to come. One mill in this section is reported to have a 30-day supply of scrap on hand but this is very much an exception. Most plants are operating with only a few days' supply and some are working directly from freight cars with no scrap piles whatsoever available.

IRON AND STEEL SCRAP PRICES

Going prices as obtained in the trade by IRON AGE editors, based on representative tonnages. Where asterisks are used they indicate the OPA ceiling price to which must be added brokerage fee and adjusted freight.

PITTSBURGH

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

No. 1 hvy. melting	$20.00*
RR. hvy. melting	21.00*
No. 2 hvy. melting	20.00*
RR. scrap rails	21.50*
Rails 3 ft. and under	23.50*
No. 1 comp'd sheets	20.00*
Hand bdld. new shts.	20.00*
Hvy. axle turn.	19.50*
Hvy. steel forge turn.	19.50*
Mach. shop turn.	15.00*
Short shov. turn.	17.00*
Mixed bor. and turn.	15.00*
Cast iron borings	16.00*
Hvy. break cast.	16.50*
No. 1 cupola	20.00*
RR. knuck. and coup.	24.50*
RR. coil springs	24.50*
Rail leaf springs	24.50*
Rolled steel wheels	24.50*
Low phos. bil. crops	25.00*
Low phos.	22.50*
RR. malleable	22.00*

CHICAGO

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18.75*
No. 1 bundles	18.75*
No. 2 dealers' bndls.	18.75*
Bundled mach. shop turn.	18.75*
Galv. bundles	16.75*
Mach. shop turn.	13.75*
Short shovels, turn.	15.75*
Cast iron borings	14.75*
Mix. borings & turn.	13.75*
Low phos. hvy. forge	23.75*
Low phos. plates	21.25*
No. 1 RR. hvy. melt.	19.75*
Reroll rails	22.25*
Miscellaneous rails	20.25*
Angles & splice bars	22.25*
Locomotive tires, cut	24.25*
Cut holsters & side frames	22.25*
Standard stl. car axles	25.75*
No. 3 steel wheels	23.25*
Couplers & knuckles	23.25*
Agricul. malleable	22.00*
RR. malleable	22.00*
No. 1 mach. cast.	20.00*
Rails 3 ft. and under	22.25*
No. 1 agricul. cast.	20.00*
Hvy. breakable cast.	16.50*
RR. grate bars	15.25*
Cast iron brake shoes	15.25*
Stove plate	19.00*
Clean auto cast.	20.00*
Cast iron carwheels	20.00*

CINCINNATI

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
No. 1 bundles	19.50*
No. 2 bundles	19.50*
Mach. shop turn.	$10.50 to 11.00
Shoveling turn.	12.50 to 13.00
Cast iron borings	11.50 to 12.00
Mixed bor. & turn.	11.50 to 12.00
Low phos. plate	22.00*
No. 1 cupola cast.	20.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Scrap rails	21.00*

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars

No. 1 hvy. melting	$15.05*
No. 2 hvy. melting	15.05*
Nos. 1 and 2 bundles	15.05*
Busheling	15.05*
Turnings, shovelings	12.05*
Machine shop turn.	10.05*
Mixed bor. & turn.	10.05*
Cl'n cast, chem. bor.	$13.06 to 14.15*
Machinery cast	20.00*
Breakable cast.	16.50*
Stove plate	19.00*

DETROIT

Per gross ton, brokers' buying prices:

No. 1 hvy. melting	$17.32*
No. 2 hvy. melting	17.32*
No. 1 bundles	17.32*
New busheling	17.32*
Flashings	17.32*
Mach. shop turn.	12.32*
Short shov. turn.	14.32*
Cast iron borings	13.32*
Mixed bor. & turn.	12.32*
Low phos. plate	19.82*
No. 1 cupola cast.	20.00*
Charging box cast.	19.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Automotive cast.	20.00*

PHILADELPHIA

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18.75*
No. 2 bundles	18.75*
Mach. shop turn.	13.75*
Shoveling turn.	15.75*
Cast iron borings	14.75*
Mixed bor. & turn.	13.75*
No. 1 cupola cast.	20.00*
Hvy. breakable cast.	16.50*
Cast, charging box	19.00*
Hvy. axle forge turn.	18.25*
Low phos. plate	21.25*
Low phos. punchings	21.25*
Billet crops	21.25*
RR. steel wheels	23.25*
RR. coil springs	23.25*
RR. malleable	22.00*

ST. LOUIS

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

Heavy melting	$17.50*
Bundled sheets	17.50*
Mach. shop turn.	12.50*
Locomotive tires, uncut	21.00*
Misc. std. sec. rails	19.00*
Rerolling rails	21.00*
Steel angle bars	21.00*
Rails 3 ft and under	21.50*
RR. springs	22.00*
Steel car axles	24.50*
Stove plate	19.00*
Grate bars	15.25*
Brake shoes	15.25*
RR. malleable	22.00*
Cast iron carwheels	20.00*
No. 1 mach'ery cast	20.00*
Breakable cast.	16.50*

BIRMINGHAM

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

No. 1 hvy. melting	$17.00*
No. 2 hvy. melting	17.00*
No. 2 bundles	17.00*
No. 1 busheling	17.00*
Long turnings	12.00*
Shoveling turnings	14.00*
Cast iron borings	13.00*
Bar crops and plate	$18.50 to 19.50*
Structural and plate	18.50 to 19.50*
No. 1 cast	20.00*
Stove plate	19.00*
Steel axles	18.50*
Scrap rails	18.50
Rerolling rails	20.50*
Angles & splice bars	20.50 to 21.00
Rails 3 ft. & under	21.00*
Cast iron carwheels	19.00*

YOUNGSTOWN

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

No. 1 hvy. melting	$20.00*
No. 2 hvy. melting	20.00*
Low phos. plate	22.50*
No. 1 busheling	20.00*
Hydraulic bundles	20.00*
Mach. shop turn.	15.00*
Short shovel. turn.	17.00*
Cast iron borings	16.00*

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$15.33*
No. 2 hvy. melting	15.33*
Comp. black bundles	15.33*
Comp. galv. bundles	13.33*
Mach. shop turn.	10.33*
Mixed bor. & turn.	10.33*
Shoveling turn.	12.33*
No. 1 cupola cast.	20.00*
Hvy. breakable cast	16.50*
Charging box cast	19.00*
Stove plate	19.00*
Clean auto cast	20.00*
Unstrip. motor blks.	17.50*
Cl'n chem. cast bor.	14.33*

BUFFALO

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

No. 1 hvy. melting	$19.25*
No. 1 bundles	19.25*
No. 2 bundles	19.25*
No. 2 hvy. melting	19.25*
Mach. shop turn.	14.25*
Shoveling turn.	16.25*
Cast iron borings	15.25*
Mixed bor. & turn.	14.25*
Stove plate	19.00*
Low phos. plate	21.75*
Scrap rails	20.75*
Rails 3 ft. & under	22.75*
RR. steel wheels	23.75*
Cast iron car wheels	20.00*
RR. coil & leaf spgs.	23.75*
RR. knuckles & coup.	23.75*
RR. malleable	22.00*
No. 1 busheling	19.25*

CLEVELAND

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
Compressed sheet stl.	19.50*
Drop forge flashings	19.00
No. 2 bundles	19.50*
Mach. shop turn.	14.50*
Short shovel.	16.50*
No. 1 busheling	19.50*
Steel axle turn.	19.00*
Low phos. billet and bloom crops	24.50*
Cast iron borings	15.50*
Mixed bor. & turn.	14.50*
No. 2 busheling	17.00*
No. 1 machine cast	20.00*
Railroad cast	20.00*
Railroad grate bars	15.25*
Stove plate	19.00*
RR. hvy. melting	20.50*
Rails 3 ft. & under	23.00*
Rails 18 in. & under	24.25*
Rails for rerolling	23.00*
Railroad malleable	22.00*
Elec. furnace punch	22.00*

SAN FRANCISCO

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

RR. hvy. melting	$18.00*
No. 1 hvy. melting	17.00*
No. 2 hvy. melting	17.00*
No. 2 bales	$15.00 to 15.75
No. 3 bales	8.50 to 9.25
Mach. shop turn.	6.50 to 7.25
Elec. furn. 1 ft. und.	15.50 to 17.00
No. 1 cupola cast.	19.00 to 21.00

LOS ANGELES

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

No. 1 hvy. melting	$17.00
No. 2 hvy. melting	17.00
No. 1 bales	$16.00 to 17.00
No. 2 bales	15.50 to 16.00
No. 3 bales	8.00 to 9.00
Mach. shop turn.	7.00
No. 1 cupola cast.	19.00 to 21.00

SEATTLE

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

RR. hvy. melting	$14.50*
No. 1 & No. 2 hvy. melting	14.50*
Elec. furn. 1 ft. und.	$14.00 to 15.00
No. 1 cupola cast.	20.00*

HAMILTON, ONT.

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

Heavy melting	$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

Comparison of Prices . .

Advances over past week in Heavy Type; declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel: (cents per pound)	Sept. 3, 1946	Aug. 27, 1946	July 30, 1946	Sept. 4, 1945
Hot-rolled sheets	2.425	2.425	2.425	2.20
Cold-rolled sheets	3.275	3.275	3.275	3.05
Galvanized sheets (24 ga.)	4.05	4.05	4.05	3.70
Hot-rolled strip				
6-in. and under	2.45	2.45	2.45	2.10
Over 6 in.	2.35	2.35	2.35	2.10
Cold-rolled strip	3.05	3.05	3.05	2.80
Plates	2.50	2.50	2.50	2.25
Plates, wrought iron	4.112	4.112	4.112	3.80
Stain's c-r strip (No. 302)	30.30	30.30	30.30	28.00
Tin and Terneplate: (dollars per base box)				
Tinplate, standard cokes	$5.00	$5.00	$5.00	$5.00
Tinplate, electro (0.50 lb)	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30
Bars and Shapes: (cents per pound)				
Merchant bars	2.50	2.50	2.50	2.25
Cold-finished bars	3.10	3.10	3.10	2.75
Alloy bars	2.92	2.92	2.92	2.70
Structural shapes	2.35	2.35	2.35	2.10
Stainless bars (No. 302)	25.97	25.97	25.97	24.00
Wrought iron bars	4.76	4.76	4.76	4.40
Wire and Wire Products: (cents per pound)				
Bright wire	3.05	3.05	3.05	2.75
Wire nails	3.75	3.75	3.75	2.90
Rails: (dollars per net ton)				
Heavy rails	$43.39	$43.39	$43.39	$43.00*
Light rails	49.18	49.18	49.18	45.00*
*per gross ton				
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$39.00	$39.00	$39.00	$36.00
Sheet bars	38.00	38.00	38.00	36.00
Slabs, rerolling	39.00	39.00	39.00	36.00
Forging billets	47.00	47.00	47.00	42.00
Alloy blooms, billets, slabs	58.43	58.43	58.43	54.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.30	2.30	2.30	2.15
Skelp	2.05	2.05	2.05	1.90

Pig Iron*: (per gross ton)	Sept. 3, 1946	Aug. 27, 1946	July 30, 1946	Sept. 4, 1945
No. 2 foundry, Phila.	$30.43	$30.43	$30.34	$26.84
No. 2, Valley furnace	28.50	28.50	28.50	25.00
No. 2, Southern, Cin'ti.	27.80	27.80	28.94	25.44
No. 2, Birmingham	24.88	24.88	24.88	21.38
No. 2 foundry, Chicago†	28.50	28.50	28.50	25.00
Basic, del'd eastern Pa.	29.93	29.93	29.84	26.34
Basic, Valley furnace	28.00	28.00	28.00	24.50
Malleable, Chicago†	28.50	28.50	28.50	25.00
Malleable, Valley	28.50	28.50	28.50	25.00
L. S. charcoal, Chicago	42.34	42.34	42.34	42.34
Ferromanganese‡	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is 60¢ per ton.

‡ For carlots at seaboard.

* Prices retroactive to May 29; the price increase should be reflected in THE IRON AGE Comparison of Prices table since June 4.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$20.00	$20.00	$20.00	$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.32	17.32	17.32	17.32
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia	20.00	20.00	20.00	20.00
No. 1 cast, Chicago	20.00	20.00	20.00	20.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$8.75	$8.75	$8.75	$7.50
Foundry coke, prompt	8.50	8.50	9.85	9.00
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro., Conn.	14.375	14.375	14.375	12.00
Copper, Lake, Conn.	14.375	14.375	14.375	12.00
Tin, Straits, New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25
Lead, St. Louis	8.10	8.10	8.10	6.35
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	14.50	14.50	14.50	14.50

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.

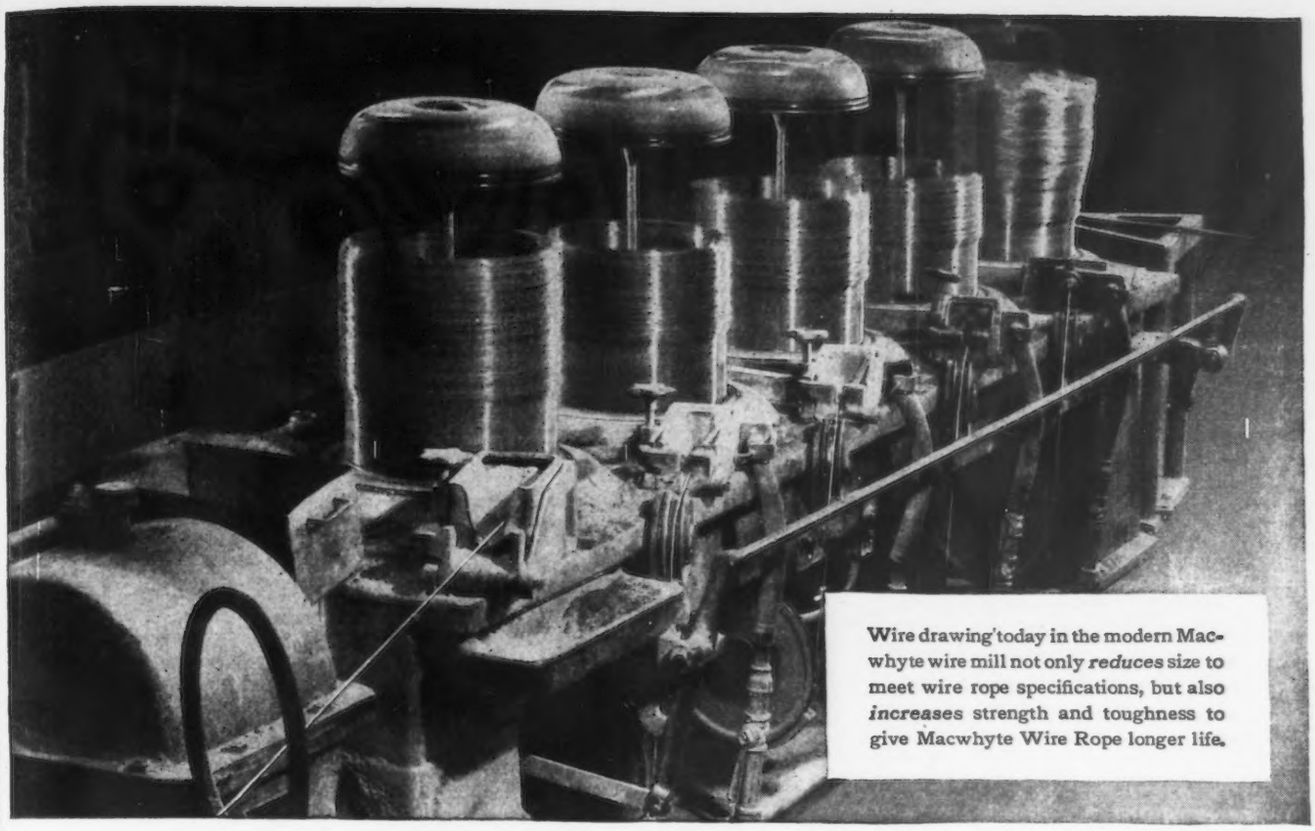
	FINISHED STEEL	PIG IRON	SCRAP STEEL
Sept. 3, 1946	2.73011¢ per lb	$28.13 per gross ton	$19.17 per gross ton
One week ago	2.73011¢ per lb	$28.13 per gross ton	$19.17 per gross ton
One month ago	2.73011¢ per lb	$28.13 per gross ton	$19.17 per gross ton
One year ago	2.44076¢ per lb	$24.61 per gross ton	$19.17 per gross ton

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1946	2.73011¢ July 4	2.54490¢ Jan. 1	$28.13 May 29	$25.37 Jan. 1	$19.17	$19.17
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	$19.17 Jan. 2	$18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 3

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.



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Metal flows cold

TO INCREASE YOUR DOLLAR VALUE

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You get a better, longer lasting Macwhyte Wire Rope, because we cold-draw rope wire from heat-treated wire rods.

Tungsten-carbide dies, polished to a satin-finish with diamond dust and oil, are used. The wire is p-u-l-l-e-d through the dies cold. This results in an extremely smooth round wire of practically double strength with great flexibility to resist bending fatigue.

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NO. 861

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MACWHYTE PREformed and Non-PREformed Internally Lubricated Wire Ropes . . . MONARCH WHYTE STRAND Wire Rope . . . Special Traction Elevator Rope . . . ATLAS Braided Wire Rope SLINGS . . . Hi-Fatigue Aircraft Cables, Assemblies, Tie-Rods . . . Stainless Steel Wire Rope . . . Monel Metal Wire Rope, Galvanized Wire Rope.

Make MACWHYTE your headquarters for WIRE ROPE and SLINGS

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points, in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. (1) Mill run sheet, 10¢ per 100 lb under base; primes, 25¢ above base. (2) Unassorted commercial coating. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25¢ per 100 lb to fabricators. (8) Also shafting. For quantities of 20,000 lb to 39,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (11) Boxed. (12) This base price for annealed, bright finish wires, commercial spring wire. (13) Produced to dimensional tolerances in AISI Manual Sect. 6. (14) Billets only. (15) 9/32 in. to 47/64 in., 0.15¢ per lb higher.

Basing Points	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	10 Pacific Ports, Cars	DELIVERED TO Detroit	New York	Philadelphia
INGOTS															
Carbon, rerolling	($33.00 f. o. b. mill)														
Carbon, forging	$38	$38	$38	$38	$38	$38	$38								
Alloy	$43.69	$43.69				$43.69	(Bethlehem, Massillon, Canton, Coatesville=$43.69)								
BILLETS, BLOOMS, SLABS															
Carbon, rerolling	$39	$39	$39	$39	$39	$39	$39	$39	(Provo=$50.20, Duluth=$41[14])			$51[14]	$41		
Carbon, forging billets	$47	$47	$47	$47	$47	$47	$47	(Provo=$59.20, Duluth=$49[14])				$59[14]	$49		
Alloy	$58.43	$58.43				$59.43	(Bethlehem, Massillon, Canton=$58.43)						$60.43		
SHEET BARS	$38	$38		$38		$38	$38	$38	(Canton=$38)						
PIPE SKELP	2.05¢	2.05¢					2.05¢	2.05¢	(Coatesville=2.95¢)						
WIRE RODS [15]															
No. 5 to 9/32 in.	2.30¢	2.30¢		2.30¢	2.30¢		(Worcester=2.40¢)				2.55¢	2.80¢			
SHEETS															
Hot-rolled	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.525¢	2.425¢		2.975¢	2.525¢	2.685¢	2.615¢
Cold-rolled [1]	3.275¢	3.275¢	3.275¢	3.275¢		3.275¢	3.275¢		3.375¢	3.275¢		3.925¢	3.375¢	3.615¢	3.635¢
Galvanized (24 gage)	4.05¢	4.05¢	4.05¢		4.05¢	4.05¢	4.05¢	4.05¢	4.15¢	4.05¢		4.60¢		4.31¢	4.24¢
Enameling (20 gage)	3.80¢	3.80¢	3.80¢	3.80¢			3.80¢		3.90¢	3.80¢		4.45¢	3.90¢	4.20¢	4.18¢
Enameling (10 Gage)	3.20¢	3.20¢	3.20¢	3.20¢			3.20¢		3.30¢	3.20¢		3.85¢	3.30¢	3.60¢	3.56¢
Long ternes [2]	4.05¢	4.05¢	4.05¢									4.80¢		4.45¢	4.41¢
STRIP															
Hot-rolled [3] 6 in. and under	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢		2.45¢			2.45¢		3.10¢	2.55¢	2.85¢	2.81¢
Hot-rolled [3] over 6 in.	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢		2.35¢			2.35¢		3.00¢	2.45¢	2.75¢	2.71¢
Cold-rolled [4]	3.05¢	3.15¢		3.05¢			3.05¢	(Worcester=3.25¢)					3.15¢	3.45¢	3.41¢
Cooperage stock	2.55¢	2.55¢			2.55¢		2.55¢							2.95¢	
TINPLATE															
Standard cokes, base box	$5.00	$5.00	$5.00		$5.10			$5.10	$5.10					$5.375	$5.301
Electro, box 0.25 lb	$4.35	$4.35	$4.35					$4.35							
Electro, box 0.50 lb	$4.50	$4.50	$4.50					$4.60	$4.60						
Electro, box 0.75 lb	$4.65		$4.65					$4.75	$4.75						
BLACKPLATE															
29 gage [5]	3.30¢	3.30¢	3.30¢					3.40¢	3.40¢					3.67¢	3.59¢
TERNES, MFG.															
Special coated, base box	$4.30	$4.30	$4.30					$4.40	$4.30						
BARS															
Carbon steel	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	(Duluth=2.60¢) (Provo, Utah=3.20¢)			2.85¢	3.15¢	2.60¢	2.84¢	2.86¢
Rail steel [6]	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢					2.85¢	3.15¢			
Reinforcing (billet) [7]	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢			2.70¢	2.75¢	2.45¢	2.61¢	2.69¢
Reinforcing (rail) [7]	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢				2.70¢	2.75¢	2.45¢		
Cold-finished [8]	3.10¢	3.10¢	3.10¢	3.10¢		3.10¢	(Detroit=3.15¢) (Toledo=3.25¢)							3.44¢	3.43¢
Alloy, hot-rolled	2.92¢	2.92¢				2.92¢	2.92¢	(Bethlehem, Massillon, Canton=2.92¢)					3.02¢		
Alloy, cold-drawn	3.62¢	3.62¢	3.62¢	3.62¢		3.62¢							3.73¢		
PLATE								(Coatesville and Claymont=2.50¢, Provo, Utah=3.20¢)							
Carbon steel [13]	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢		2.50¢	2.50¢			2.85¢	3.05¢	2.72¢	2.71¢	2.553¢
Floor plates	3.75¢	3.75¢									4.10¢	4.40¢		4.15¢	4.15¢
Alloy	3.79¢	3.79¢			(Coatesville=3.79¢)						4.27¢	4.49¢		4.01¢	3.895¢
SHAPES															
Structural	2.35¢	2.35¢	2.35¢		2.35¢	2.35¢	(Bethlehem=2.35¢)				2.60¢	3.00¢		2.54¢	2.49¢
SPRING STEEL, C-R															
0.26 to 0.50 carbon	2.80¢			2.80¢			(Worcester=3.20¢)								
0.51 to 0.75 carbon	4.30¢			4.30¢			(Worcester=4.50¢)								
0.76 to 1.00 carbon	6.15¢			6.15¢			(Worcester=6.35¢)								
1.01 to 1.25 carbon	8.35¢			8.35¢			(Worcester=8.55¢)								
WIRE [9]															
Bright [12]	3.05¢	3.05¢		3.05¢	3.05¢		(Worcester=3.15¢) (Duluth=3.10¢)					3.55¢		3.44¢	3.41¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	4.00¢	4.00¢		4.00¢			(Worcester=4.10¢) (Trenton=4.25¢)					4.50¢		4.39¢	4.339¢
PILING															
Steel sheet	2.65¢	2.65¢				2.65¢						3.20¢		2.99¢	3.01¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

BASING POINT	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	22.99	24.67	17.01	17.47	20.69	25.29
Billets P'gh, Chi, Canton, Newark, N. J., Watervliet, Syracuse, Balt.	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh Chi, Canton Dunkirk, Balt, Phila, Reading, Watervliet, Syracuse, Newark, N. J., Ft. Wayne, Titusville	22.99	24.67	17.01	17.47	20.69	25.29
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville	27.05	25.97	20.02	20.56	24.34	29.75
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet	27.05	25.97	20.02	20.56	24.34	29.75
Plates, P'gh, Middletown, Canton	31.38	29.21	23.28	23.80	28.67	33.00
Shapes, structural, P'gh, Chi	27.05	25.97	20.02	20.56	24.34	29.75
Sheets, P'gh, Chi, Middletown, Canton, Balt.	38.95	36.79	28.67	31.38	35.16	38.49
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.43	23.28	18.39	18.93	25.97	37.87
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown	32.46	30.30	23.80	24.34	34.62	56.26
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila.	27.05	25.97	20.02	20.56	24.34	29.75
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Newark, N. J., Syracuse	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton, (4 in. to 6 in.)	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, O.)*

An increase of 8.2 pct applies to base price and extras

	Base per lb
High speed	67¢
Straight molybdenum	54¢
Tungsten-molybdenum	57½¢
High-carbon-chromium*	43¢
Oil hardening*	24¢
Special carbon*	22¢
Extra carbon*	18¢
Regular carbon*	14¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi 3¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	per lb
Field grade	3.90¢
Armature	4.25¢
Electrical	4.75¢
Motor	5.425¢
Dynamo	6.125¢
Transformer 72	6.625¢
Transformer 65	7.625¢
Transformer 58	8.125¢
Transformer 52	8.925¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo. Pacific ports add 75¢ per 100 lb on all grades.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb	
No. 1 O.H., net ton	$43.39
Angle splice bars, 100 lb	2.85
(F.o.b. basing points)	*per net ton*
Light rails (from billets)	$49.18
Light rails (from rail steel)	49.18
	base per lb
Cut spikes	3.65¢
Screw spikes	5.55¢
Tie plate, steel	2.55¢
Tie plates, Pacific Coast	2.70¢
Track bolts	6.50¢
Track bolts, heat treated, to railroads	6.75¢
Track bolts, jobbers discount	63-5

Basing points, light rails, Pittsburgh, Chicago, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25¢.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$8.50	$17.00
15-lb coating I.C.	9.50	19.00
20-lb coating I.C.	10.00	20.00

CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Pa.	21.00*	22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	18.72	....
Inconel-clad		
10 pct, f.o.b. Coatesville	26.00	....
Monel-clad		
10 pct, f.o.b. Coatesville	24.96	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

*Includes annealing and pickling.

WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Basing Points Named	Pacific Coast Basing Points†
	base per keg	
Standard wire nails	$3.75	$4.25
Coated nails	3.75	4.25
Cut nails, carloads	4.85	....
	base per 100 lb	
Annealed fence wire	$3.50	$4.00
Annealed galv. fence wire	3.85	4.35
	base column	
Woven wire fence*	72	90
Fence posts, carloads	74	91
Single loop bale ties††	72	97
Galvanized barbed wire**	79	89
Twisted barbless wire	79	89

*15½ gage and heavier. **On 80-rod spools in carload quantities.

†Prices subject to switching or transportation charges.

††Add 50c a ton.

HIGH TENSILE, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otis-coloy	Yoloy	Y-50
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood*	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	American Rolling Mill
Plates	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	.....
Sheets									
Hot-rolled	3.575	3.575	3.575	3.575	3.575	3.575	3.575	3.575	.....
Cold-rolled	4.525	4.525	4.525	.....	4.525	4.525	4.525	4.525	5.225*
Galvanized	.....	.....	.....	.....	.....	5.50	.....	.....	.....
Strip									
Hot-rolled									
Over 6-in.	3.60	3.60	3.60	.....	3.60	3.60	3.60	3.60	.....
6-in & under	3.70	3.70	3.70	.....	3.70	3.70	3.70	3.70	.....
Cold-rolled	4.30	.....	4.30	.....	4.40	.....	4.30	4.30	5.00*
Commodity	.....	.....	.....	.....	.....	.....	4.45	.....	.....
Shapes	.....	3.45	.....	.....	3.45	3.45	3.45	3.45	.....
Beams	.....	3.45	.....	.....	.....	3.45	.....	.....	.....
Bars									
Hot-rolled	3.70	3.70	3.70	.....	.....	3.70	3.70	3.732†‡	.....
Cold-rolled	.....	.....	.....	.....	.....	.....	.....	4.382†‡	.....
Bar shapes	.....	3.85	.....	.....	3.85	3.85	3.85	3.85	.....
Billets, blooms, slabs (per gross ton)									
Structural	.....	.....	.....	.....	.....	.....	.....	$74.65†	.....
Forging	.....	.....	.....	.....	.....	.....	.....	$82.23†	.....

* 21 gage and lighter. † Alloy extras apply. ‡ Add 0.379¢ for forging grade, heat treated.

WELDED PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh district and Lorain, Ohio, mills

(F.o.b. Pittsburgh only on wrought pipe) base price—$200.00 per net ton

Steel (buttweld)

	Black	Galv.
½-in.	60½	48
¾-in.	63½	52
1-in. to 3-in.	65½	54½

Wrought Iron (buttweld)

½-in.	17⅞	+4⅜
¾-in.	24¼	2⅝
1-in. and 1¼-in.	28⅝	9⅛
1½-in.	33	11⅞
2-in.	32⅜	11⅜

Steel (lapweld)

2-in.	58	46½
2½-in. and 3-in.	61	49½
3½-in. to 6-in.	63	51½

Wrought Iron (lapweld)

2-in.	24⅞	4⅞
2½-in. to 3½-in.	25⅞	7½
4-in.	28⅛	11⅜
4½-in. to 8-in.	27	10¼

Steel (butt, extra strong, plain ends)

½-in.	58½	47½
¾-in.	62½	51½
1-in. to 3-in.	64	54

Wrought Iron (same as above)

½-in.	18⅞	+1⅝
¾-in.	25⅝	4¾
1-in. to 2-in.	33	13

Steel (lap, extra strong, plain ends)

2-in.	56	45½
2½-in. and 3-in.	60	49½
3½-in. to 6-in.	63½	53

Wrought Iron (same as above)

2-in.	28⅛	8⅝
2½-in. to 4-in.	34	16¼
4½-in. to 6-in.	32⅜	14⅝

On buttweld and lapweld steel pipe jobbers are granted a discount of 5 pct. On l.c.l. shipments prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lapweld and one point lower discount, or $2 a ton higher on all buttweld.

BOILER TUBES

Seamless steel and lapweld commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft f.o.b. Pittsburgh, in carload lots

	Seamless Cold-Drawn	Seamless Hot-Rolled	Lapweld, Hot-Rolled
2 in. O.D. 13 B.W.G.	16.52	13.90	13.20
2½ in. O.D. 12 B.W.G.	22.21	18.70	17.67
3 in. O.D. 12 B.W.G.	24.71	20.79	19.56
3½ in. O.D. 11 B.W.G.	31.18	26.25	24.68
4 in. O.D. 10 B.W.G.	38.68	32.56	30.55

(Extras for less carload quantities)

40,000 lb or ft and over.....Base
30,000 lb or ft to 39,999 lb or ft.... 5 pct
20,000 lb or ft to 29,999 lb or ft....10 pct
10,000 lb or ft to 19,999 lb or ft....20 pct
5,000 lb or ft to 9,999 lb or ft....30 pct
2,000 lb or ft to 4,999 lb or ft....45 pct
Under 2,000 lb or ft.....65 pct

CAST IRON WATER PIPE

Per net ton

6-in. to 24-in., del'd Chicago.....$70.33
6-in. to 24-in., del'd New York.... 69.60
6-in. to 24-in., Birmingham..... 61.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles or Seattle for all rail shipment; rail and water shipment less 84.40

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

An increase of 12 pct applies to listings except Large Rivets

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

Base discount less case lots

Percent Off List

½ in. & smaller x 6 in. & shorter...65½
9/16 & ⅝ in. x 6 in. & shorter.....63½
¾ to 1 in. x 6 in. & shorter.....61
1⅛ in. and larger, all lengths.....59
All diameters over 6 in. long.....59
Lag, all sizes 62
Plow bolts 65

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller 62
9/16 to 1 in. inclusive.....59
1⅛ to 1½ in. inclusive.....57
1⅝ in. and larger 56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	U.S.S.	S.A.E.
Base discount less keg lots		
7/16 in. and smaller	..	64
½ in. and smaller.....	62	..
½ in. through 1 in.....	..	60
9/16 in. through 1 in.....	59	..
1⅛ in. through 1½ in....	57	58
1⅝ in. and larger	56	..

In full keg lots, 10 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Consumer

Packages, nuts loose .....71 and 10
In packages 71
In bulk 80

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets

(½ in. and larger)

Base per 100 Lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $4.75
F.o.b. Lebanon, Pa. 4.90

Small Rivets

(7/16 in. and smaller)

Percent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .....65 and 5

Cap and Set Screws *(In packages)*	*Percent Off List* *Consumer*
Upset full fin, hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.....	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes.....	36
Fillister head cap, listed sizes.....	51

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Maximum price f.o.b. consumer's plant, $30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

Effective CaF, Content:	*Base price per short ton*
70% or more $33.00	
65% but less than 70%.....	32.00
60% but less than 65%.....	31.00
Less than 60%	30.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

Per Gross Ton

Old range, bessemer $5.45
Old range, non-bessemer 5.30
Mesaba, bessemer 5.20
Mesaba, non-bessemer 5.05
High phosphorus 5.05

Prices are for ore shipped on and after June 24, 1946, and for ore covered by adjustable pricing agreements authorized by Order No. 8, RMPR 113.

These prices do not reflect the recent ICC increase in freight rates.

METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh..19¼¢ to 21½¢
Copper, electrolytic, 100 and 375 mesh .....23½¢ to 27½¢
Copper, reduced, 150 and 200 mesh ..... 22⅜¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe.....11¢ to 16¢
Swedish sponge iron, 100 mesh, c.i.f. N. Y., carlots, Ocean bags...7.4¢ to 8¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots ..... 4¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots ..... 63¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe 25¢ to 31¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe ..... 17¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe .....90¢ to $1.75
Aluminum, 100, 200 mesh, carlots 25¢
Antimony, 100 mesh ..... 30¢
Cadmium, 100 mesh $1.75
Chromium, 100 mesh and finer..... $1.25
Lead, 100, 200 & 300 mesh.13¼¢ to 16¾¢
Manganese, minus 325 mesh and coarser .....44¢ to 61¢
Nickel, 150 mesh ..... 51½¢
Silicon, minus 325 mesh and coarser .....26¢ to 55¢
Solder powder, 100 mesh..8½¢ plus metal
Tin, 100 mesh .....58¾¢
Tungsten metal powder, 98%-99%, any quantity, per lb..... $2.60
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.. $2.65
Under 100 lb..... $2.90

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$8.75
Connellsville, Pa., hand drawn.	9.35
Foundry, beehive (f.o.b. oven)	
Fayette Co., W. Va.	8.10
Connellsville, Pa.	8.50
Foundry, Byproduct	
Chicago, del'd	15.10
Chicago, f.o.b.	14.35
New England, del'd	16.04
Kearny, N. J., f.o.b.	14.40
Philadelphia, del'd	14.63
Buffalo, del'd	14.75
Portsmouth, Ohio, f.o.b.	12.85
Painesville, Ohio, f.o.b.	13.50
Erie, del'd	14.50
Cleveland, del'd	14.55
Cincinnati, del'd	14.60
St. Louis, del'd	15.10†
Birmingham, del'd	12.25

†Except producers situated in states other than Missouri, Alabama or Tennessee, sellers may charge a maximum delivered price of $15.60 in the St. Louis Mo., and East St. Louis, Ill., switching districts.

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

Per 1000

Super-duty brick, St. Louis.....$76.05
First quality, Pa., Md., Ky., Mo., Ill., Ohio 60.40
First quality, New Jersey 65.90
Sec. quality, Pa., Md., Ky., Mo., Ill. 51.80
Sec. quality, New Jersey 57.70
Sec. quality, Ohio 52.95
Ground fire clay, net ton, bulk.... 8.95

Silica Brick

Pennsylvania and Birmingham....$60.40
Chicago District 69.30
Silica cement, net ton (Eastern)... 10.60

Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Plymouth Meeting, Chester	$54.00

Magnesite Brick

Standard, Balt. and Chester $76.00
Chemically bonded, Baltimore 65.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in sacks $44.50
Domestic, f.o.b. Chewelah, Wash., in bulk 22.00
in sacks 26.00
Clinker (dead burned) dolomite, per ton East, $9.30; Midwest, add 10¢; Mo. Valley, add 20¢.

WAREHOUSE PRICES

Delivered metropolitan areas, per 100 lb.

Cities	SHEETS			STRIP			Plates ¼ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
				Hot-Rolled										
	Hot-Rolled (10 gage)	Cold-Rolled	Galvanized (24 gage)	6 in. and Under	Over 6 in.	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A-8617-20	Hot-Rolled, A-8742-50 Ann.	Cold-Drawn, A-8617-20	Cold-Drawn, A-8742-50 Ann.
**Philadelphia	$3.743	$5.097	$5.218a	$4.272	$4.172	$5.022	$3.855	$3.916	$4.072	$4.522	$6.016	$7.116	$7.372	$8.422
New York	3.715	4.838[1]	5.48	4.324	4.224	5.024	4.018	4.008	4.103	4.553	6.058	7.158	7.403	8.453
Boston	3.999	4.969[2]	5.674	4.456	4.356	4.965	4.162	4.162	4.294	4.594	6.212	7.312	7.444	8.494
Baltimore	3.619	5.077	5.344	4.252	4.152	....	3.844	4.009	4.052	4.502	6.109	7.209	7.352	8.402
Norfolk	3.996	....	5.821	4.515	4.415	....	4.221	4.252	4.315	4.615	....	....	....	....
Chicago	3.475	4.425	5.581	3.95	3.85	4.90[6]	3.80	3.80	3.75	4.20	5.80	6.90	....	8.00
Milwaukee	3.612	4.562[1]	5.537	4.087	4.077	5.037[6]	3.937	3.937	3.887	4.337	6.037	7.037	7.187	8.237
Cleveland	3.575	4.625	5.327	3.95	3.85	4.706	3.65	3.838	3.60	4.20	6.006	7.106	6.95	8.00
Buffalo	3.575	4.625	5.20	4.109	4.109	4.959[6]	3.92	3.65	3.60	4.20	5.80	6.90	6.95	8.00
Detroit	3.675	4.725	5.45	4.05	3.95	....	3.859	3.911	3.70	4.25	6.13	7.23	7.55	8.65
Cincinnati	3.65	4.70[1]	5.275	4.025	3.925	4.961	3.911	3.941	3.861	4.461	6.15	7.25	7.311	8.65
St. Louis	3.622	4.572[1]	5.581	4.097	3.997	5.181[6]	3.947	3.947	3.897	4.481	6.181	....	7.331	....
Pittsburgh	3.575	4.625	5.20	3.95	3.85	4.70	3.65	3.65	3.60	4.20	5.80	6.90	6.95	7.95
St. Paul	3.797	4.747	5.635	4.272	4.172	5.352	4.122	4.122	4.072	4.811	6.202	6.302	7.352	7.402
Omaha	4.05	5.72	6.00	4.52	4.42	....	4.37	4.37	4.32	4.915	....	....	....	....
Indianapolis	3.745	4.795	5.37	4.12	4.02	4.99	3.88	3.88	3.83	4.43	6.13	....	7.28	....
Birmingham	3.675	....	5.20	4.05	3.95	....	3.80	3.80	3.75	4.903	....	....	....	....
Memphis	4.19	4.885	5.715	4.565	4.465	....	4.315	4.315	4.265	4.78	....	....	....	....
New Orleans	4.283*	5.304	5.808	4.658	4.558	....	4.408	4.408*	4.358*	5.079	....	....	....	....
Houston	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Los Angeles	4.85	6.60[1]	6.55	5.30	5.20	....	4.80	4.70	4.65	6.03	....	....	....	....
San Francisco	4.12	6.87	6.35	4.60	4.50	4.15	4.15	4.15	4.30	5.78	....	....	....	....
Seattle	4.87[5]	7.27[2]	6.40	4.60	4.50	....	5.00[5]	4.70[5]	4.60[5]	6.23	....	....	....	....
Portland	4.87[4]	6.82[2]	6.20	5.10	5.00	....	5.00[4]	4.70[4]	4.70[4]	5.98	8.15	....	9.20	....
Salt Lake City	4.75	....	6.62[7]	5.88	5.78	....	5.23[7]	5.23[7]	5.13	6.35	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars, 1500 lb base.

NE ALLOY BARS: 1000 to 39,999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 450 to 3749 lb; (4) 300 to 4999 lb; (5) 300 to 10,000 lb; (6) 2000 lb and over; (7) 3500 lb and over.

(a) Philadelphia: Galvanized sheet, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

* Add 0.271¢ for sizes not rolled in Birmingham.

** City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

PIG IRON PRICES

Per gross ton, retroactive to May 29.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	29.00	29.50	30.00	30.50	....	Boston	Everett	$0.50 Arb.	29.50	30.00	30.50	31.00	....
Birdsboro	29.00	29.50	30.00	30.50	34.00	Boston	Birdsboro-Steelton	4.47	....	....	....	....	38.47
Birmingham	23.50*	24.88*	....	29.50	....	Brooklyn	Bethlehem	2.78	31.78	32.28	32.78	33.28	....
Buffalo	27.50	28.50	29.00	29.50	34.00	Brooklyn	Birdsboro	3.26	....	....	....	....	37.26
Chicago	28.00	28.50	28.50	29.00	....	Canton	Clev. Ygstn, Sharpsvil.	1.54	29.54	30.04	30.04	30.54	....
Cleveland	28.00	28.50	28.50	29.00	....	Canton	Buffalo	3.55	....	....	....	....	37.55
Detroit	28.00	28.50	28.50	29.00	....	Cincinnati	Birmingham	4.30	27.80*	29.18*	....	....	....
Duluth	28.50	29.00	29.00	29.50	....	Cincinnati	Hamilton	1.24	....	....	29.74	....	....
Erie	28.00	28.50	29.00	29.50	....	Cincinnati	Buffalo	4.89	....	....	....	....	38.89
Everett	29.00	29.50	30.00	30.50	....	Jersey City	Bethlehem	1.70	30.70	31.20	31.70	32.20	....
Granite City	28.00	28.50	28.50	29.00	....	Jersey City	Birdsboro	2.16	....	....	....	....	38.16
Hamilton	28.00	28.50	28.50	....	....	Los Angeles	Provo	5.25	31.25	31.75	....	....	....
Neville Island	28.00	28.50	28.50	29.00	....	Los Angeles	Buffalo	16.33	....	....	....	....	50.33
Provo	26.00	26.50	....	....	....	Mansfield	Cleveland-Toledo	2.16	30.16	30.66	30.66	31.16	....
Sharpsville	28.00	28.50	28.50	29.00	....	Mansfield	Buffalo	3.74	....	....	....	....	37.74
Sparrows Point	29.00	29.50	....	....	....	Philadelphia	Swedeland	0.93	29.93	30.43	30.93	31.43	....
Steelton	29.00	....	....	....	34.00	Philadelphia	Birdsboro	1.38	....	....	....	....	35.38
Swedeland	29.00	29.50	30.00	30.50	....	San Francisco	Provo	5.25	31.25	31.75	....	....	....
Toledo	28.00	28.50	28.50	29.00	....	San Francisco	Buffalo	16.33	....	....	....	....	50.33
Youngstown[1]	28.00	28.50	28.50	29.00	....	Seattle	Provo	5.25	31.25	31.75	....	....	....
						Seattle	Buffalo	16.33	....	....	....	....	50.33
						St. Louis	Granite City	0.50 Arb.	28.50	29.00	29.00	29.50	....
						St. Louis	Buffalo	7.86	....	....	....	....	41.86

* Republic Steel Corp. has been granted a $2 increase on basic and foundry pig iron produced at Birmingham.

(1) Struthers Iron & Steel Co., Struthers, Ohio, may charge 50¢ per ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Charcoal pig iron base prices for Lyles, Tenn., and Lake Superior furnaces, $33.00 and $34.00, respectively. Newberry Brand of Lake Superior charcoal iron $39.00 per g.t., f.o.b. furnace. Delivered to Chicago, $42.34.

High phosphorus iron sells at Lyles, Tenn., at $28.50.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorous content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron, silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$34.00; f.o.b. Buffalo—$35.25. Add $1.00 per ton for each additional 0.50 pct Si. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for prices of comparable analysis.

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.

Carload lots (bulk)	$135.00
Less ton lots (packed)	148.50
F.o.b. Pittsburgh	139.50

$1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Briquets—cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	6.05	6.30	6.60
Ton lots	6.65	7.55	8.55
Less ton lots	6.80	7.80	8.80

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$35.00	$36.00
Less ton	47.50	48.50
F.o.b. Pittsburgh, Chicago	40.00	

Manganese Metal

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	30
L.c.l. lots	32

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.10% max. C, 0.06% P, 90% Mn	21.00	21.40	21.65
0.10% max. C	20.50	20.90	21.15
0.15% max. C	20.00	20.40	20.65
0.30% max. C	19.50	19.90	20.15
0.50% max. C	19.00	19.40	19.65
0.75% max. C, 7.00% max. Si	16.00	16.40	16.65

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed. 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	6.05
Ton lots	6.70
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet.	5.80
Ton lots	6.30
Less ton lots	6.55

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, $51.25 f.o.b. Keokuk, Iowa; $48.00 f.o.b. Jackson, Ohio; $49.25 f.o.b. Niagara Falls. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots, packed.

	Eastern	Central	Western
96% Si, 2% Fe	13.10	13.55	16.50
97% Si, 1% Fe	13.45	13.90	16.80

Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si.

	Eastern	Central	Western
Carload, bulk	3.60	3.75	3.90
Ton lots	4.05	4.55	4.60
Less ton lots	4.45	4.80	4.85

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
50% Si	7.05	7.50	7.65
75% Si	8.55	8.70	9.25
80-90% Si	9.50	9.65	10.15
90-95% Si	11.80	11.95	12.40

Ferrochrome

(65-72% *Cr, 2% max. Si*)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	23.00	23.40	24.00
0.10% C	22.50	22.90	23.50
0.15% C	22.00	22.40	23.00
0.20% C	21.50	21.90	22.50
0.50% C	21.00	21.40	22.00
1.00% C	20.50	20.90	21.50
2.00% C	19.50	19.90	20.50
66-71% Cr, 4-10% C	14.50	14.90	15.00
62-66% Cr, 5-7% C	15.05	15.45	15.55

Briquets—contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	9.20	9.50	9.90
Ton lots	9.80	10.30	11.80
Less ton lots	10.10	10.60	12.10

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low-carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N. High-carbon type: 66.71% Cr, 4-5% C, 0.75% N. Add 5¢ per lb to regular high-carbon ferrochrome price schedule.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	15.60	16.00	16.10
Ton lots	16.65	17.30	18.50
Less ton lots	17.30	17.95	19.15

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

	Eastern	Central	Western
Carload	20.00	20.40	21.00
Ton lots	21.00	21.65	22.85
Less ton lots	22.00	22.65	23.85

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed. 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	83.50	85.00	86.25
0.50% max. C	79.50	81.00	82.25
9.00% min. C	79.50	81.00	82.25

Chromium—Copper

Contract price, cents per pound of alloy, f.o.b. Niagara Falls, freight allowed east of the Mississippi. 8-11% Cr, 88-90% Cu, 1.00% max. Fe, 0.50% max. Si.

Shot or ingot	45¢

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	13.00	13.50	15.55
Ton lots	14.50	15.25	17.40
Less ton lots	15.50	16.25	18.40

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	15.50	16.00	18.05
Ton lots	16.50	17.35	19.10
Less ton lots	17.00	17.85	19.60

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1¢ for central zone; 5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.35	$1.75	$4.25
Less ton lots	1.60	2.00	5.00

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

	Eastern	Central	Western
Ton lots	12.00	12.75	14.75
Less ton lots	12.50	13.25	15.25

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	11.75	12.50	14.50
Less ton lots	12.25	13.00	15.00

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe.

	Eastern	Central	Western
Ton lots	12.00	12.85	14.60
Less ton lots	12.50	13.35	15.10

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ X down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained T, 5 ton lots, freight allowed	$1.88
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.70
Crucible	$2.80
High speed steel (Primos)	$2.90
Vanadium pentoxide, 88-92% V_2O_5 technical grade, contract basis, per pound contained V_2O_5	$1.10
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb.	
Ton lots	$2.25
Less ton lots	$2.30
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo	95¢
Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo	80¢
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo	80¢
Ferrotitanium, 40-45%, 0.10%C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	$1.23
Less ton lots	$1.25
Ferrotitanium, 20-25%, 0.10%C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High-carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads	$142.50
Ferrophosphorus, 18%, electric or blast furnaces, f.o.b. Anniston, Ala., carlots, with $3 unitage freight equalled with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, Electrolytic, 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., $3 unitage freight equalized with Nashville, per gross ton	$75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	14¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	4.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload	5.75¢
Ton lots	7.25¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	8.00¢
Ton lots	8.75¢
Less ton lots	9.25¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed. Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Less ton lots	$1.30	$1.3075	$1.329

Manganese—Boron 75.80% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.055

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$2.10	$2.1125	$2.1445

Silcaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

carload lots	25¢
Ton lots	26¢

Silvaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Carload lots	58¢
Ton lots	59¢

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.

No. 1	87.5¢
No. 6	60¢
No. 79	45¢

Bortram, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

You're Sitting on a Lot of NEW MERCHANDISE!

The shortage of scrap metal, desperate during wartime, is still serious. The production of many of the things you need is being slowed up . . . will be interrupted unless steel mills continue to get a larger supply of scrap iron. More than half of the steel used in America requires scrap for its production. Call your scrap metal dealer . . . gather and sell worn-out iron and steel of all types. This is necessary to help provide uninterrupted production of steel and things made of steel. Help speed delivery of many of the items on your *want list* . . . turn in your scrap today.

All Continental products are made from open hearth steel and are uniformly processed and finished according to the needs of their use. Increasing Continental production is "stepping up" shipments of steel sheets, wire, Chain Link fence, etc.

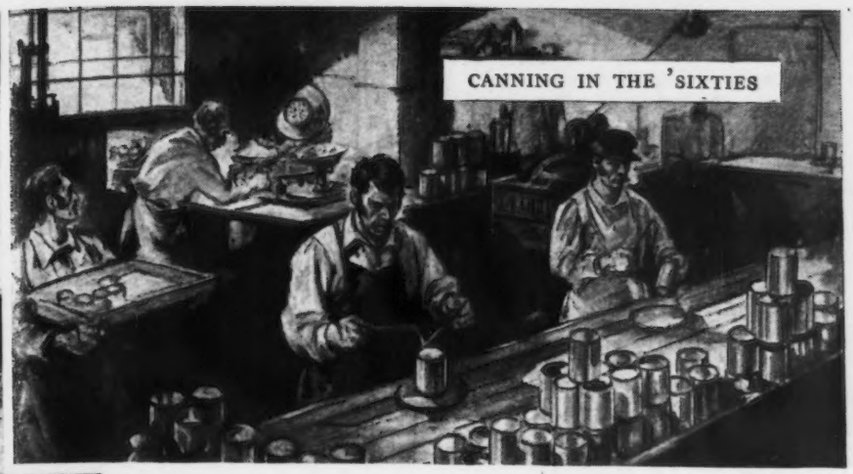
CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF STEEL SHEETS, including Continental GALVANIZED, COPPER-STEEL Galvanized, KONIK steel sheets Galvanized, UNIFORM SPANGLE Galvanized, DULL COAT, Continental GALVANNEALED, ELECTRICAL, Hot Rolled Pickled, and many styles of Formed Roofing. ALSO, Manufacturer's Wire in many sizes, shapes, tempers, and finishes, Continental Chain Link Fence, Nails, and other steel products.

DRAWN FOR JONES & LAUGHLIN STEEL CORPORATION BY ORISON MAC PHERSON

(Advertisement)



SEVERAL GREAT INDUSTRIES WORK TOGETHER TO BRING YOU THE BEST IN FOODS

The convenient, economical, ready-to-eat packed foods that you buy today are made possible by the close cooperation of several great American industries. These are farming, food packing, container and closure manufacturing, and the steel industry. They work with one another to bring you the best there is in foods. You get these foods garden fresh, safely packed, pressure-cooked, ready for your table at any time, in any season of the year.

America's achievements in commercial canning have made us the leader in production and preservation of foods. This enables us to share these foods with the world's distressed areas. Commercial canning facilitates universal distribution of food products. It also makes possible the storage of surplus foods. It mitigates the effects of crop failures.

The part of Jones & Laughlin Steel Corporation in the preservation and conservation of American foods is basic. J&L produces Controlled Quality tin plate used in manufacture of cans and of closures for glass containers.

Constantly improving its tin plate, J&L looks ahead to the time when commercial canning will bring to your table a still greater variety and abundance of wholesome foods, fresh from the richness of American farms, gardens, orchards and waters.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH, PENNSYLVANIA
J&L STEEL
STRONGER, CONTROLLED QUALITY STEELS

CANNING

More than 3,000 packing plants are engaged in preserving the good foods conserved for future use each year in the United States. Fresh foods are canned at the peak of perfection within a few hours of harvesting. To handle them properly the modern packing plant must be efficient and spotlessly clean. Steel machines are used in the receiving, washing, sorting, grading, blanching, peeling and coring of fruits and vegetables. They are also used in filling the containers (see illustration), exhausting the air from them, sealing, processing in steam retorts, cooling, labeling, packing, warehousing and shipping.

Commercial canning 80 years ago (see sketch), used crude, heavy cans. These were hand filled and hand closed. When tin plate manufacture was introduced in America by the steel industry, fast, safe packing of foods by machinery quickly developed. Perfection of cold reduced steel strip and improvement of tin coatings gave packing industry new impetus.

Behind today's food packers are the container manufacturers, who supply the packer at the right time and in the necessary quantity. They furnish technological advice and guidance, as well as practical information on processing treatments for various products. They also carry on experimental work on new techniques. Their service men are constantly assisting the packer. Can and closure makers must be familiar with the amount of acreage planted, conditions of crops and other variables influencing the demand for containers.

60 canisters a day was best output of expert tinsmith in the 1840's, working by hand-and-foot power with iron sheets crudely coated with tin. Today, with modern tin plate a packer's can line produces 400 tin cans a minute, over 3,000 times the output of an early can maker.

Behind the can and closure makers is the tin plate industry, of which Jones & Laughlin is a part. J&L supplies the best possible tin plate in a wide variety of grades, coatings and tempers. The steel industry works with the can and closure manufacturers constantly in improving coatings and fabricating qualities of tin plate.

Tin plate is made to exacting specifications. The tin coating on the light gage cold reduced steel sheet must be evenly distributed to resist corrosion and provide a good soldering surface. The gage must be uniform in order to pass smoothly through the complicated can-making and closure machines. The temper of the sheet must be exact to form can bodies without fluting or breaking. The sheet must be ductile to "flow" readily in dies for forming and deep drawing operations. The coating must provide good surface for lacquers, enamels and lithography. These qualities are assured in J&L tin plate, by the Jones & Laughlin Controlled Quality method of manufacture.

where the job calls for HEAT RESISTANCE

get ABSCO-MEEHANITE castings

Among outstanding Absco-Meehanite castings are those of our Heat Resistant type. These castings are specially cast for long service life in work where high temperatures must be withstood year in and year out. Their specifications call for resistance to growth, warping and scaling under heat.

Heat resistance is combined with other Absco-Meehanite properties. A wide range of choice makes possible a close match between the metal and its service. The giant distributor plate assembly shown at the left, for instance, demanded strength, corrosion resistance and machinability to complement its first requisite — resistance to heat. In this unusual application, each of no less than 90 separate castings fits into a place of its own in the completed assembly.

"Unusual castings for unusual service" is more than a catchword at American Brake Shoe Company — it is a watchword for those seeking specification castings on a production basis — castings backed by a knowledge of foundry techniques that is unmatched in the industry. Write and tell us your specific needs.

AMERICAN Brake Shoe COMPANY

BRAKE SHOE AND CASTINGS DIVISION
230 Park Ave., New York 17, N. Y.

ABSCO-MEEHANITE PROPERTIES

1. Strength (Shear, Compressive, Tensile and Transverse)
2. Impact Resistance
3. Corrosion Resistance
4. Wear Resistance
5. Heat Resistance
6. Toughness
7. Rigidity
8. Machinability
9. Pressure Tightness
10. Vibration Absorption

4627

London Economist

(CONTINUED FROM PAGE 109)

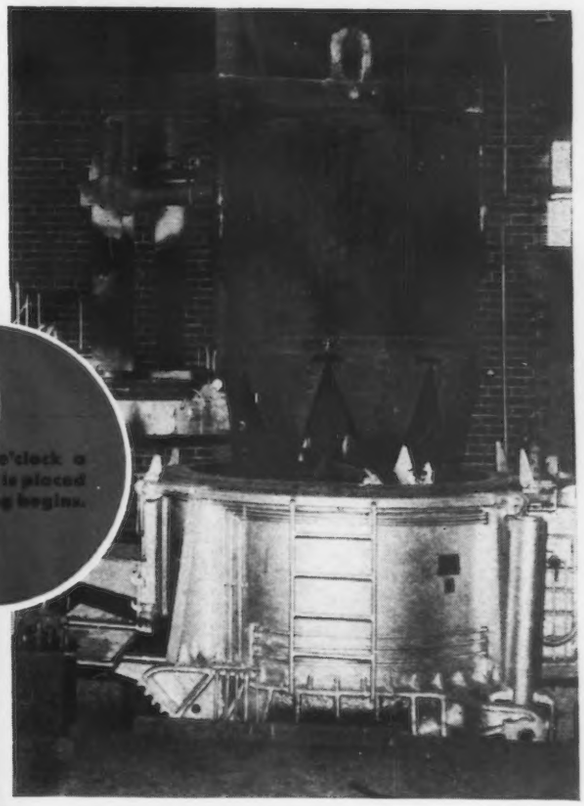
treaties—or outside them—which tend to restrict and divert trade, or distort international economic relations to the prejudice of the great majority of the United Nations and of world peace and prosperity."

MR. Byrnes' speech had now and then a slightly Gladstonian ring, but the dispute in the Luxembourg Palace never rose to the level of a good old-fashioned argument on the merits of the case. Strong words about enslavement and domination were bandied about freely; and it was the political effect of such epithets that mattered most. But if strong adjectives and nouns were cast aside, it became painfully obvious that red herrings had been dragged in by both sides. Mr. Byrnes' simple-minded identification of free trade with prosperity, world peace and economic freedom sounded somewhat out of date. Mr. Molotov's identification of Russia's more or less exclusive economic arrangements with the Balkan countries with the economic equality of weak and strong sounded at least premature. The economic dependence of small countries on the Great Powers, however, is a fact which neither the Paris Conference nor any other conference can undo. The Balkan countries will remain economically dependent under a free trade system as under a Russian-planned economy; for their only alternative to economic dependence is stagnation and decay. They are now confronted with a choice between one or another type of dependence; and the choice is going to be made for them by the Peace Conference.

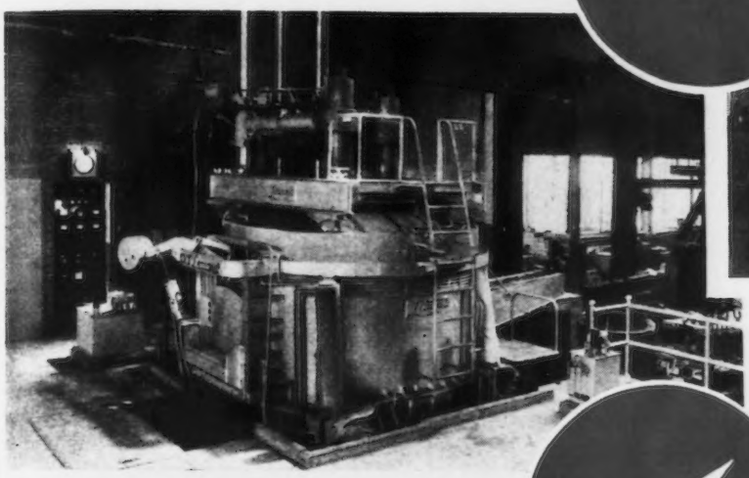
Russian policy, when it is looked upon through the prism of American free trade doctrine, must appear as an unfair attempt to draw the Danube Basin into the Russian economic orbit. From the Russian viewpoint, however, the American crusade for free trade amounts to an attempt to restore a capitalist economy in the Danube Basin. The balance of economic power is so heavily weighted in favor of the United States that the United States can simply rely on the free interplay of trade, unfettered competition and the export of capital to make its view-

12 TONS - 100 MINUTES

THAT'S *Clockwork Economy* IN METAL MELTING

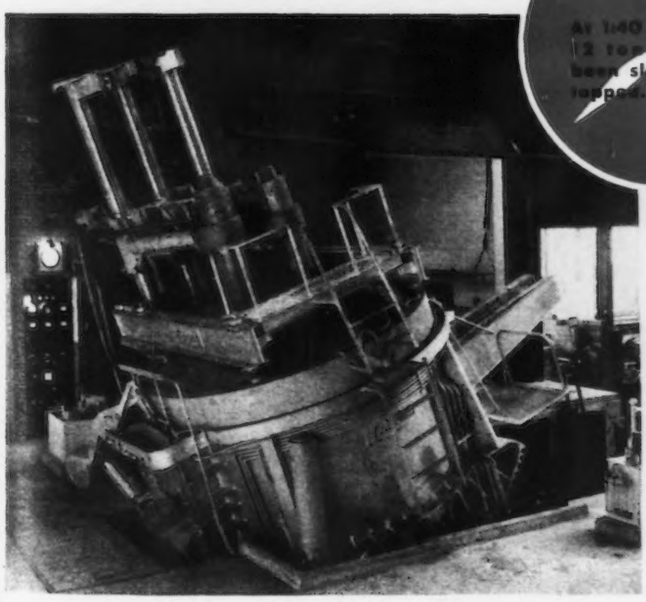


At 12:00 o'clock a full charge is placed and melting begins.



This furnace is size OT (usual heat size 10 to 12 tons). Other equally fast and economical Lectromelt top charge furnaces are available in capacities ranging from 100 tons down to 250 pounds.

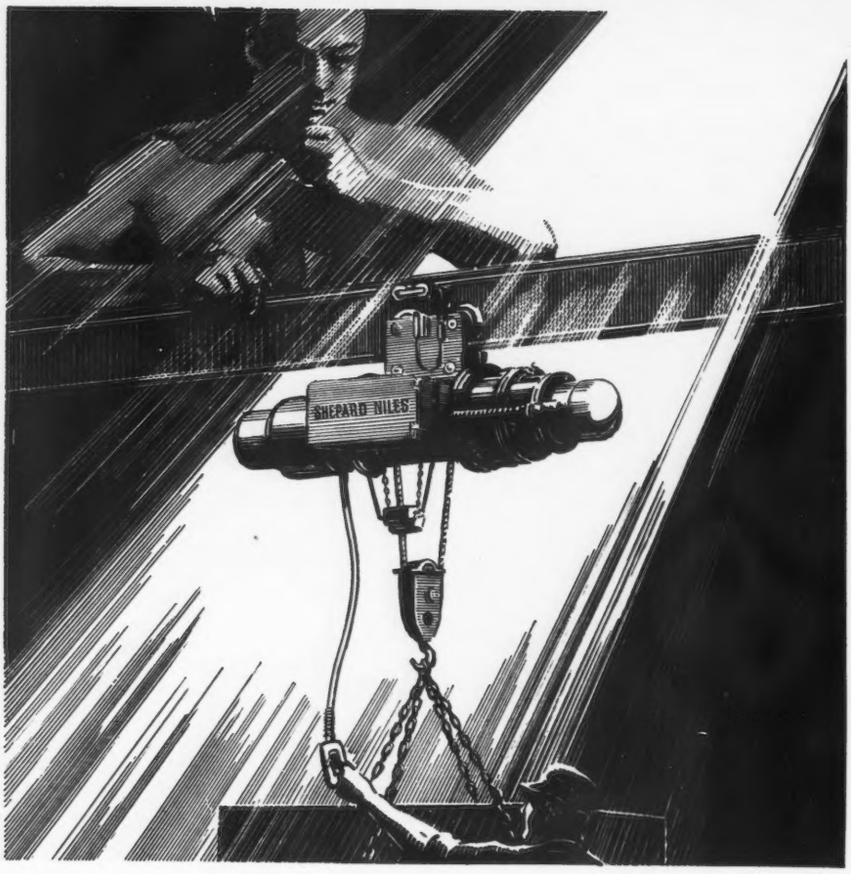
At 1:40 o'clock the 12 ton heat has been slagged and tapped.



MOORE RAPID *Lectromelt* FURNACES

PITTSBURGH LECTROMELT FURNACE CORPORATION

PITTSBURGH 30, PA.



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• Never jerky, never faltering—tirelessly handling the most delicate loads as if picked up and placed by nimble fingers. This is the dependability of Shepard Niles Hoists—built with the staying power of a champion for constant load-handling with precision and safety.

Manufacturers want the most efficient, most economical handling equipment they can buy. Now more than ever this equipment must fit their particular handling requirements. Shepard Niles Hoists handle loads up to their full rated capacity with a minimum of maintenance cost—giving long durable service.

SHEPARD NILES CRANES are advanced in performance and in every detail of construction—a real contribution to efficient load-handling. They are designed and constructed to sustain high efficiency throughout a long, rugged life. Engineered construction gives dependable, smooth operation at low cost.

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To assist you in selecting such a competitive advantage as economical load-handling, Shepard Niles offers you the use of its engineering facilities and staff—without obligation.

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point automatically prevail. Russia's economic strength is so much weaker that Russia's influence in the Balkans can survive only behind the strong protective dams of a regional organization closed to free trade. That feeling of weakness seems to permeate all the Soviet tactics at the Peace Conference. Offensive in form, they are essentially defensive. But American tactics, essentially offensive insofar as they aim at reducing Russian influence in the Danube Basin, in form have been impeccably defensive.

The draft treaties have now been passed on to the commissions. It will certainly take a very long time before they emerge from the welter of detailed discussion in commissions and are laid before the plenary conference. Only then will the conference pass its final verdict on the ideological controversy initiated last week. But preliminary wrangling over matter of procedure and other points has revealed the mood in which the conference will probably go on working to its end, and the alignment of the forces that will ultimately determine the nature of Balkan peace. Whenever the rivalry between the two blocs has been pushed to extremes, the Russian bloc has been steadily isolated. The Russian delegation has commonly found itself outvoted by a majority of 15 to 6. On this central issue—the economic and social future of the Balkans—the alignment of the forces at the Peace Conference is almost certain to remain the same.

Already at the Council of Foreign Ministers France has taken the same attitude as the Western Powers in economic matters: And the attitude of France has been decisive in the conference itself, because, whenever the French vote is cast with the British and the American, the Soviet delegation is defeated by more than a two thirds majority. This explains why the Soviet delegation has adopted the tactics of filibustering.

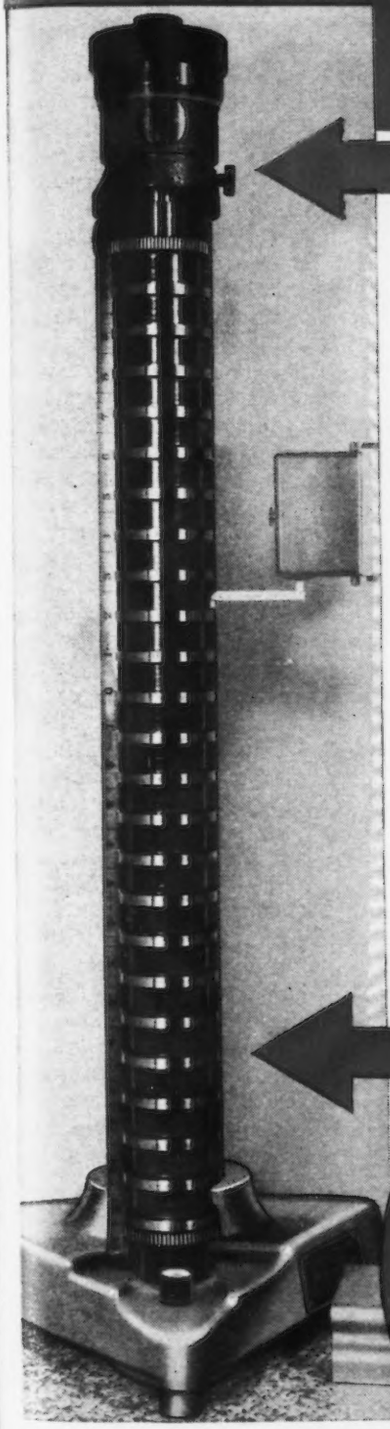
Interlake Reports Income

Cleveland

• • • **The Interlake** Iron Corp. reports second quarter income of $234,666 on gross profit of $909,635. The net was after provision of $469,969 for depreciation and amortization and $205,000 for estimated taxes on income.

SETTING TIME: 10 SECONDS! ACCURACY: .0001" in 24"!

Cadillac PLA-CHEK SPEEDS CLOSE TOLERANCES DEMANDED BY POST WAR JOBS



● Get This New 24" Model PLA-CHEK for FASTER . . . MORE ACCURATE INSPECTION.

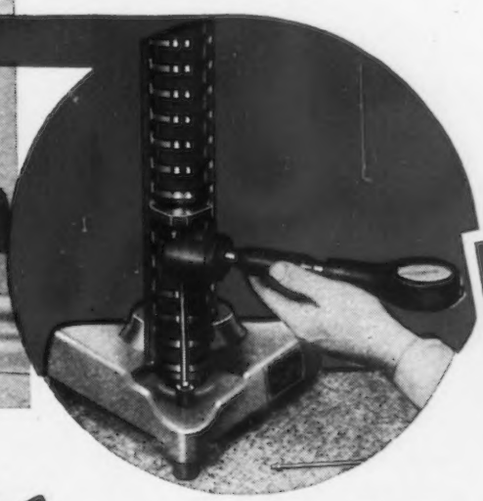
PLA-CHEK is *guaranteed* accurate to .0001" in 24". An adjustable measuring bar with an endless scale graduated from zero to 24 inches each way establishes the minute tolerances demanded today . . . quickly, easily, accurately. The micrometer thimble graduated *plus* or *minus* enables the user to check *up* and *down* from the center line of work

A reverse checking plate may be quickly and easily clipped to any one-inch step on the Pla-Chek bar. The lower measuring flange is set even with the lapped button with the micrometer thimble set at zero. Inside micrometers, telescoping gages, or internal cylinder gages can be set directly between the button and the reverse checking plate by merely setting the micrometer thimble to desired dimension.

MICROMETER THIMBLE—Arrow indicates 1" of measuring sleeve travel in addition to 1" of micrometer travel. This enables user to measure directly from center or reference line of job.

Body heat does not affect the findings of Pla-Chek. There is no contact between the inspector's hands and the measuring bar. Speed your postwar inspections with this new Pla-Chek . . . the astounding new gage for surface plate work.

REVERSE CHECKING PLATE—Speeds setting of many type gages.



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See how much time PLA-CHEK will save you. We will be glad to send it on two-weeks free trial. If this trial satisfies you, send your check. If not, return PLA-CHEK express collect and you owe us nothing. Write, Wire, or Telephone. Reverse the Charges! Telephone: PRospect 1644.

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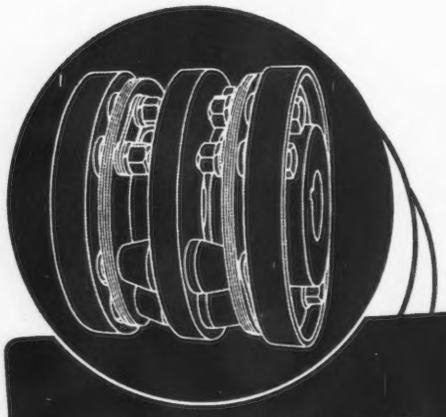
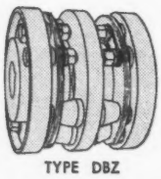
Flexible COUPLINGS

are specified by engineers wherever 100% dependability is demanded





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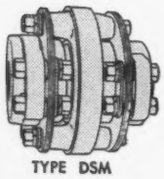
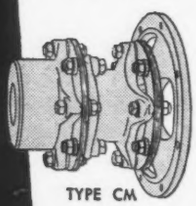


TYPE DSM



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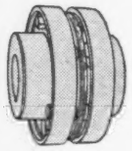

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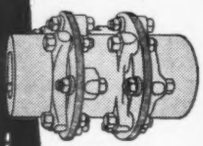
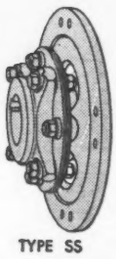


TYPE AM

THOMAS *Flexible* COUPLINGS provide for Angular and Parallel Misalignment as well as Free End Float . . . *and Eliminate* BACKLASH, FRICTION, WEAR and CROSS-PULL

NO LUBRICATION IS REQUIRED!

The Thomas All-Metal Coupling does not depend on springs, gears, rubber or grids to drive. All power is transmitted by direct pull.



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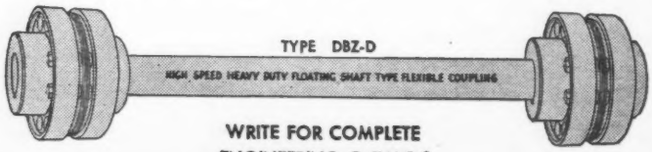


WRITE FOR COMPLETE ENGINEERING CATALOG

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

OPA Announces New Rules To Aid Stockpiling Plan

Washington

• • • **Revision of Reg. 17** for the purpose of aiding the stockpiling of strategic materials has been announced by WAA.

The regulation provides for transfer to the government stockpile of all government-owned surplus materials which are designated by the Army-Navy Munitions Board as having strategic possibilities for common defense. It now applies to all such surplus materials regardless of where located, in or outside the continental United States.

New features of this regulation as compared with the previous SPA Reg. 17 are:

(1) No distinction is made as to category, namely, minerals and metals and strategic materials; (2) no minimum pricing requirement in the disposition of strategic materials to satisfy civilian deficiencies; (3) the Munitions Board may acquire government-owned surplus strategic materials without an actual cash outlay except that they may not in any fiscal year exceed in dollar value in acquisitions from surplus stocks an amount which in turn exceeds the actual Congressional appropriation for such fiscal year; and (4) a central control is established by having RFC review reports from all owning agencies of surplus strategic materials to determine whether disposition will be for the stockpile, sale to meet civilian deficiencies, or declared surplus.

It also provides that CPA estimate current requirements of industry on a yearly basis instead of six months' supply.

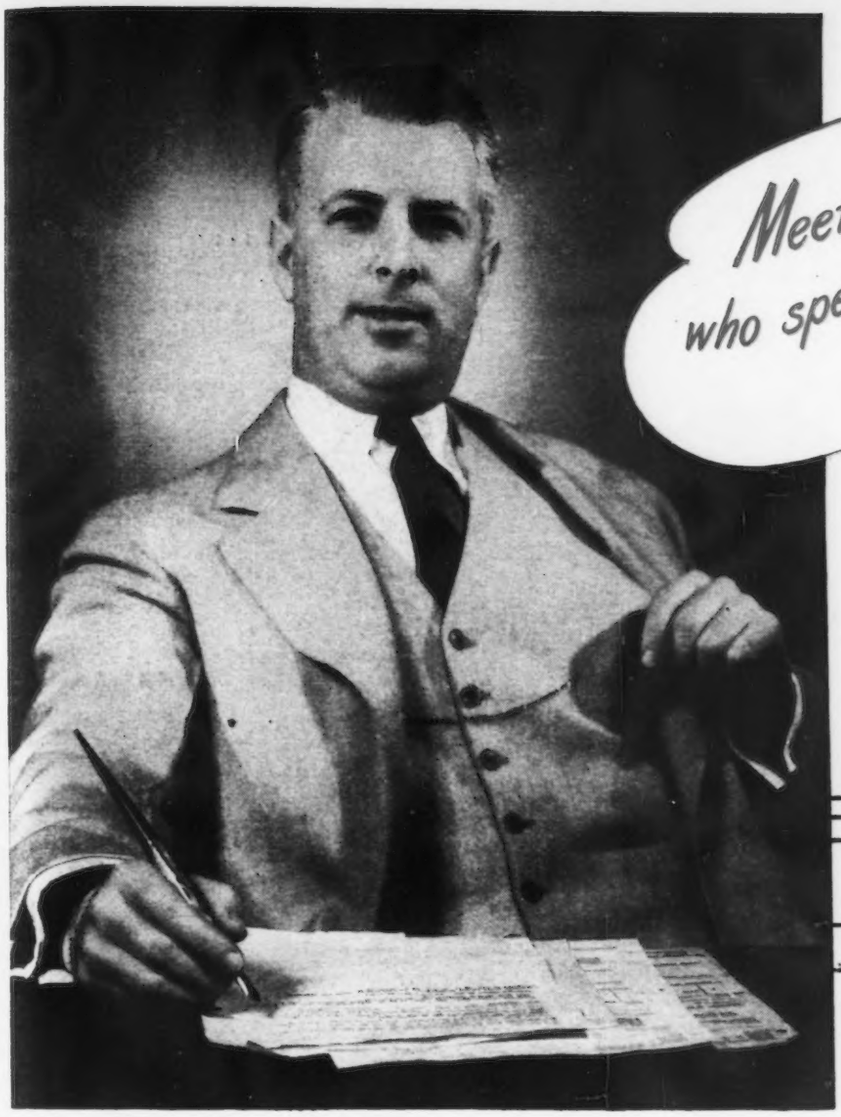
Backlog Totals $39 Million

Washington

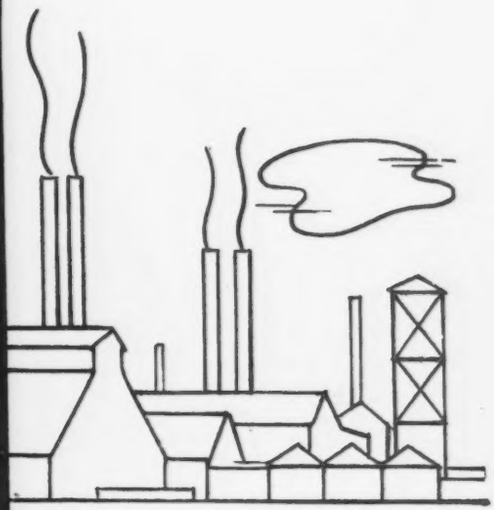
• • • **Despite dollar value** shipments of about four times the prewar monthly figure, a $39 million backlog of orders for mechanical presses places the industry more than a year back on deliveries, according to figures by CPA.

July shipments, according to the agency figures, were up to $3,712,000 from a low of $2,538,000 in Jan. as compared with the monthly average of $865,000 for 1939.

August and September shipments are expected to equal or exceed the July figure.



Meet the Man who spends the Money ...the P.A.



IT'S his duty to know whom to contact for countless items . . . his worry what to do about the promise someone didn't keep . . . his "headache" how to combat the often insistent demands of his sales department for "reciprocity" . . . his task to get around today's shortages. Yes, these and scores of other problems constantly beset the busy P.A.

He is a mentally alert, highly trained, efficient individual, with technical "know-how" and a wide understanding of human nature. His keen sense of values serves him well in buying for his company the needed material with the greatest economy.

It is significant therefore, that over the years, wide-awake, progressive purchasing agents have learned to call on Levinson Steel for dependable Warehouse and Fabricated Steel Products.

LEVINSON STEEL

THE LEVINSON STEEL COMPANY

PITTSBURGH

LS 2

OUT OUR WAY

DO YOU REALIZE WHAT IT WOULD HAVE COST TH' COMPANY IF WE HADN'T USED SOL-SPEEDI-DRI?
LOOK AT IT! THERE IT IS, IN BLACK AND WHITE! THE DUMBEST GUYS IN THE SHOP CAN SEE THAT SOL-SPEEDI-DRI CUTS ACCIDENT RATES TO THE BONE! AIN'T BEEN A SLIPPING ACCIDENT SINCE WE STARTED USING SOL-SPEEDI-DRI ON TH' FLOORS!
LOOK AT 'EM RUBBIN' IT IN! YOU'D THINK THEY CLEANED UP ALL THAT GREASE AND OIL WITH THEIR NECK-TIES INSTEAD OF SOL-SPEEDI-DRI! THEY'VE BEEN SMART AN' NOW THEY'RE CROWIN'!
HARMONY AIN'T SO GOOD-- IT'S WHEN ONE GUY WORKS HIS HEAD OFF TO SHOW UP TH' OTHERS THAT YOU REALLY GET RESULTS!
T. M. REG. U. S. PAT. OFF. COPR. 1946 BY NEA SERVICE, INC.
THE WISE BOYS
J.R.WILLIAMS

RECORDS SHOW THAT SOL-SPEEDI-DRI MAKES FLOORS CLEANER... SAFER

ACCIDENT RATES go down but workers stay on their feet when you use SOL-SPEEDI-DRI on oil-soaked, grease-slicked floors! SOL-SPEEDI-DRI . . . the white, granular absorbent . . . works like a charm on all types of floors, soaking up soluble oils, resins, syrups, solvents, acids, coolants, and regular oils and greases as a blotter soaks up ink.

No complicated machinery . . . no trained personnel . . . is required to use SOL-SPEEDI-DRI. One man can do all the work necessary. SOL-SPEEDI-DRI is economy-wise because it releases cleaning personnel for more productive work. It's production-wise because it keeps men on the job, free from the hazards of slips and falls. SOL-SPEEDI-DRI also reduces the dangers of flash-fires over oil-steeped floors. It will not readily burn, even when oil-soaked.

SUPPLIERS:
East—Safety and Maintenance Co., Inc., New York 1, N. Y.
South, Midwest and West Coast—Waverly Petroleum Products Co., Philadelphia 6, Pa.

FREE SAMPLE
Get the full story of SOL-SPEEDI-DRI today. Just write "SOL-SPEEDI-DRI" across your letterhead or business card and mail.

SOL·SPEEDI·DRI
OIL AND GREASE ABSORBENT

Gallup Polls

(CONTINUED FROM PAGE 103)

appears to be flourishing at this time, it is quite possible that American thinking may change sharply in the future. Polls during the last year have found that whenever Moscow and Washington have patched up their differences and reached agreement, public sentiment has grown more friendly toward the Russians.

• • • **Gen. Charles deGaulle** and Joseph Stalin are the two people most admired by the population of France, according to a survey conducted by the French Institute of Public Opinion, or French Gallup Poll.

French voters were asked:

"What man or woman living today anywhere in the world do you most admire?"

The vote:

General deGaulle	23
Stalin	7
Frederic Joliot-Curie	5
Winston Churchill	4
Leon Blum	3
Sir Alexander Fleming	3
General Jacques Leclerc	1
Others	23
No one in particular	31

Joliot-Curie, son-in-law of Madame Marie Curie, discoverer of radium, is a famous research scientist, and a member of the French delegation on Atomic Energy. Sir Alexander Fleming is the discoverer of penicillin.

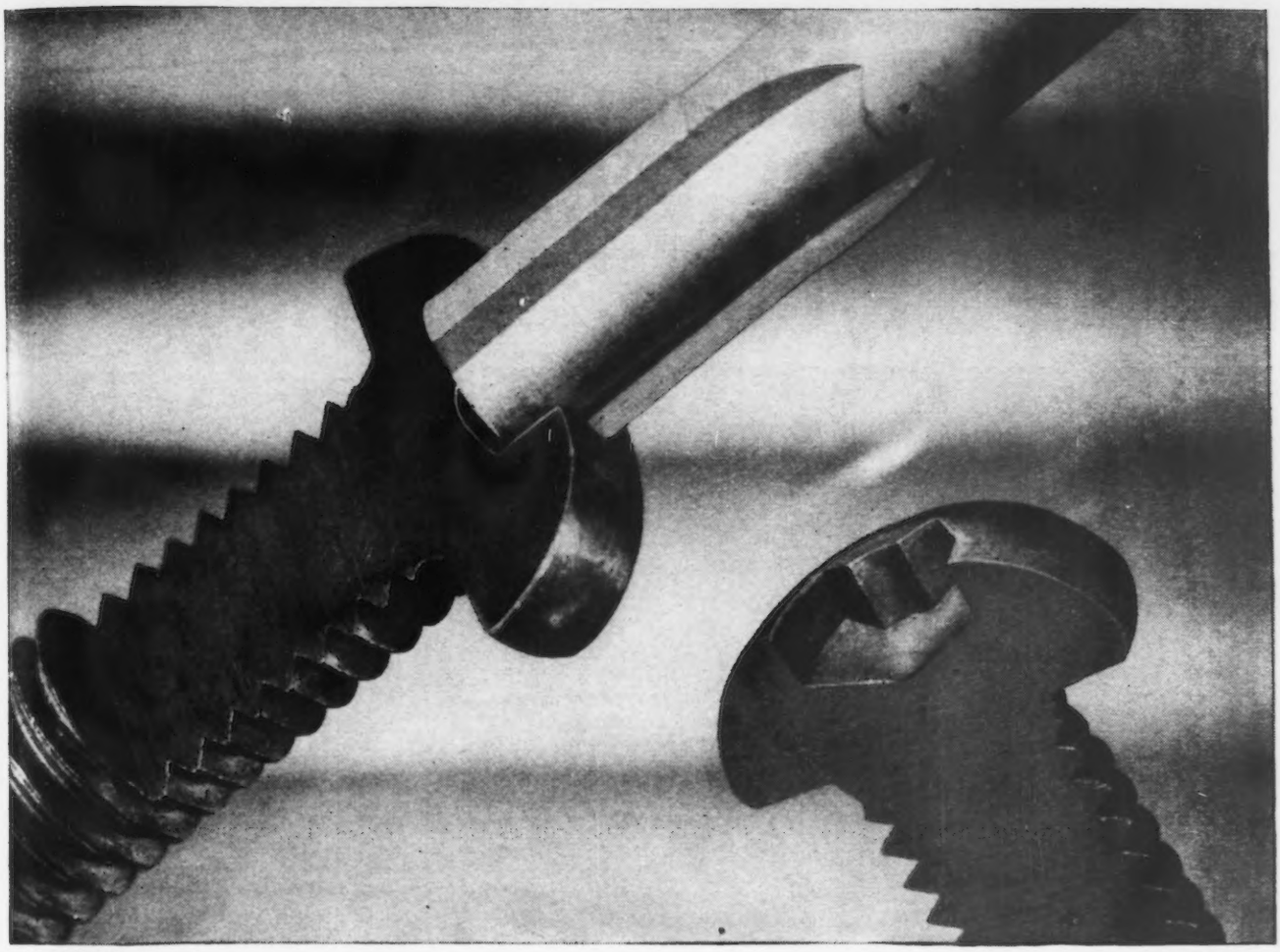
UMW to Charge J&L

Washington

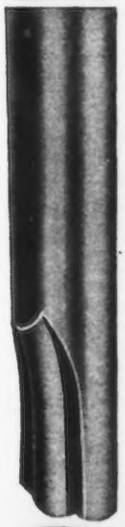
• • • **Adm. Ben Moreell,** Coal Administrator, has announced signing of an order authorizing Dist. 50, UMW, to file charges with NRLB that Jones & Laughlin Steel Corp. has refused to bargain with the local for the supervisors and foremen employed in the Vesta and Shannopin mines of the corporation in Western Pennsylvania.

This action was taken under a clause in the agreement between the government and the union which was recently ordered by the WSB and approved by the White House under the War Disputes Act.

It was also taken by pre-arrangement with both sides since it provided the only means by which the issue of unionization of mine foremen by a production workers' group could be taken to the Supreme Court.



TYPE "A" ASSEMBLY BIT



COMMON SCREWDRIVER

THE INSIDE STORY OF CLUTCH HEADS

Here It Is, showing *what* goes on inside the Clutch recess, and *why* . . . why users testify so freely that CLUTCH HEAD has features not matched by any other screw on the market for safety, speed, and savings.

Visibility a Speed Factor. The wide, roomy Clutch invites operator confidence. Saves "breaking-in" period. Presents an easy-to-hit target for stepped up production.

No Driver Canting to chew up heads and create a skid hazard. The Center Pivot Column on the Type "A" Bit guides the driver into the mating recess formation. Deep dead-center entry and straight driving become automatic.

Safe, Effortless Drive-Home. Note straight sides of the driver matching straight walls of the Clutch recess. Contact is all-square on a broad pressure area for positive torque grip and non-tapered driving.

No Ride-Out to Combat. This feature disposes of "kick-out" as set up by tapered driving . . . the commonest cause of driver slippage. The screw rides home easily without the application of fatiguing end pressure.

Lock-On Breaks "Bottlenecks". A reverse turn of the bit in the recess unites screw and driver as a unit for easy one-handed reaching to hard-to-get-at spots. Normal driving of the screw releases the Lock-On.

Sample screws and Type "A" Bit sent on request

"Outlasts Other Bits 5 TO 1"

The rugged structure of this Type "A" Bit logically explains this testimony. Also, a 60-second application of the end surface to a grinding wheel repeatedly restores it to original efficiency. No expense. No delay.

CLUTCH HEAD · SCREWS ·

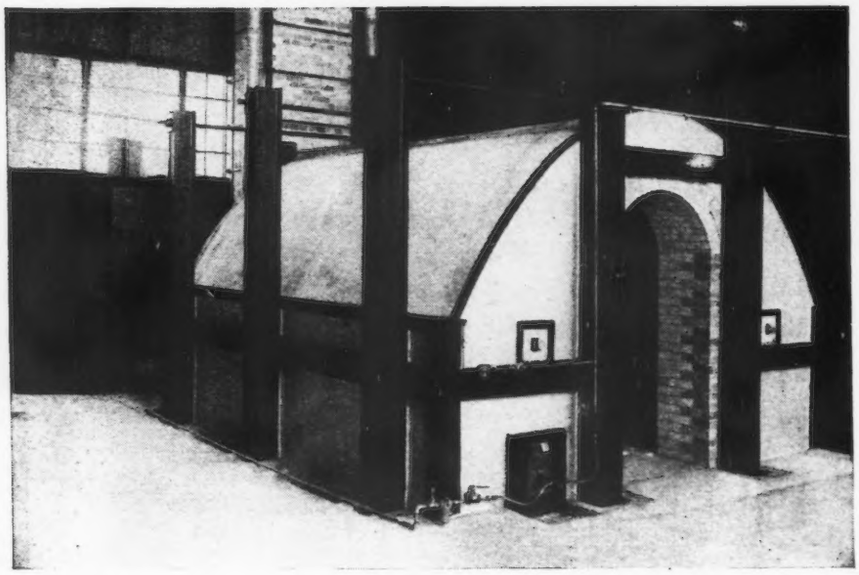
Simplifies Field Service

This is the only modern screw basically designed to operate with an ordinary screwdriver. With a Type "A" hand driver, the Lock-On feature permits the withdrawing of screws undamaged and held safely for re-use.

UNITED SCREW AND BOLT CORPORATION

CLEVELAND 2 · CHICAGO 8 · NEW YORK 7

TWO NEW SUPER REFRACTORIES FIRED TO CONE 35



Kiln for firing Remmey 99AD & Crystalite A Refractories to Cone 35

REMMEY 99AD BRAND
Over 99% Alumina

REMMEY 99 AD BRAND made of pure chemically precipitated alumina, without clay bond. Analyzes over 99% Corundum.

Corundum, the crystalline form of alumina, is more resistant than any other refractory oxide to many types of slag.

Firing to Cone 35 makes Remmey 99 AD Refractories hard and tough.

Modulus of rupture 2800 lbs. P.S.I.

PCE 42

CRYSTALITE A BRAND
Recrystallized Mullite

CRYSTALITE A BRAND is fired to Cone 35 to produce a composition closely approaching an all Crystalline Mullite Body. Due to this Crystalline Structure "Crystalite A" Refractories are highly resistant to glass furnace slags and other destructive slags.

Load test shows zero subsidence at 2950°F.

PCE 40

Note: Cone 35 in pyrometric cone tables is 3245°F.

REMMEY

Representatives: Vitrefrax Corp., Los Angeles 11, Calif.
John G. Seanor, Pittsburgh 16, Pa.

Richard C. Remmey Son Co.
Philadelphia 37, Pa.

Wrecking Crews Begin Dismantling of Army And Navy Installations

Washington

• • • **Work has begun** by wrecking crews on 2600 buildings at Camp Howze, Gainesville, Tex., and work will soon begin on a similar number within 10 other Army and Navy installations, it is announced by WAA which has provided Army Engineer Corps with $3 million to begin the work.

Reclaimed materials in short supply including plumbing, electric wiring and fixtures will be made available for the veterans hospital and housing programs; material unsuitable for reuse will be scrapped.

In addition to Camp Howze, installations, location and the number of buildings to be razed are:

Camp McCain, Grenada & Montgomery Counties, Miss., (439 buildings); Camp Murphy, Hobe Sound, Fla., (421); Camp Turner, Van Buren, Ark., (55); Sangamon Ordnance Works, Illiopolis, Ill., (561); Green River Ordnance Plant, Dixon, Ill., (59); Algona PW Camp, Algona, Iowa, (107); Gopher Ordnance Works, St. Paul, (90); McLean PW Camp, McLean, Tex., (70); Almville PW Camp, Almville, Ala., (208); and Mississippi Ordnance Plant, Flora, Miss, (582).

Additional war installations which are likely to be dismantled for the material include:

Ft. Saulsbury, Del., Camp Claiborne, La., Camp Amache, Grenada, Colo., Camp Phillips Kan., Tyson Valley Powder Farm, Mo., Concordia PW Camp, Kan., Trinidad PW Camp, Colo., Greeley PW Camp, Colo., Hereford PW Camp, Tex., Manzaner Relocation Center, Calif., and the Central Utah Relocation Center.

Canada's Disposal Hits $26,100,000 in June

Montreal

• • • **War Assets** Corp., the Canadian Government company established to dispose of surplus war goods, reported sales for June at $26,100,000, which brings total sales since the corp.'s inception to $205,000,000. Monthly average sales for the second quarter of

MICHIGAN designed and built the tools for these parts

and

MICHIGAN used the tools to machine and broach this complete product

Two "KNOW HOWs"

Broaching tools are not only designed and built at MICHIGAN—they are also used!

This builds the kind of experience and complete "Know How" that you want when selecting a source for tools or for machining and broaching production parts.

M B C

Let us analyze your production parts. Any job we accept is done with *"undivided responsibility."*

MICHIGAN BROACH CO.

10369 NORTHLAWN AVENUE, DETROIT 4, MICH.

Billet Furnace "Skid Pipes" Serve 16 to 18 Months Hardfaced; 6 to 8 Weeks Without it . . .

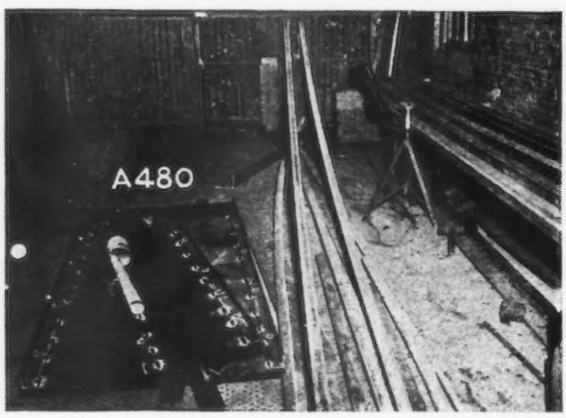
A cost item which sometimes can be lowered in rolling mill practice is the maintenance of billet heating furnace "skid pipes." One type of furnace uses four to six 2-inch double extra-heavy pipes, approximately 60

feet long, as shown in Picture A-480. These water-cooled pipes when unprotected by hardfacing material ordinarily last from six to eight weeks in their task of supporting billets on their trip through the heating furnace.

Picture A-482 shows the interior of the discharge end of a billet heating furnace, with white hot billets lying on top of the skid pipes. Furnace maintenance men are well aware of the man-hours involved in changing furnace skid pipes; to which must be added the cost of new pipes. They also know the inconvenience and disruption of production that occur when furnaces develop leaks from wear.

Amsco No. 459 Welding Rods have solved these problems by increasing the service life of rolling mill skid pipes from the usual six to eight weeks to sixteen to eighteen months, with corresponding savings. Picture A-483 shows skid pipes, hardfaced with Amsco No. 459, which had actually been in continuous service eighteen months. It is apparent that there is still a considerable quantity of weld metal on the pipes, which will be resurfaced and used as spares.

Amsco No. 459 is a cast rod of high chromium, molybdenum and carbon content that provides sound welded deposits with a Brinell hardness of 500-600. It is ideal for parts encountering severe abrasion and moderate impact, such as rolling mill guides, drag chains, coal cutter bits, dipper teeth, muller and mixer parts, and pump shells and impellers.



(Amsco Welding Products are produced and sold in Canada Works, Inc., Niagara Falls, by Canadian Ramapo Iron Ontario.)

AMSCO

Foundries at
Chicago Heights, Ill.; New Castle, Del.;
Denver, Colo.; Oakland, Calif.;
Los Angeles, Calif.; St. Louis, Mo.
Offices In Principal Cities

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS • ILLINOIS

AMERICAN Brake Shoe COMPANY

1946 totaled $23,500,000 against $18,500,000 a month for the six months ended Mar. 31, 1946, whereas for the six months immediately preceding sales totaled $4,500,000. Sales of the principal items for disposal are as follows:

Ships and other marine craft	$61,250,000
Automotive vehicles and equipment	34,300,000
Consumer goods	24,500,000
Machine tools and equipment	24,400,000
Lands and buildings	22,000,000
Mechanical	10,000,000
Metals, ferrous and nonferrous	9,000,000
Scrap, metal and other aircraft, spares and equipment	4,300,000
Radio and radar sets and parts	3,500,000

Rubber Products Plant Moves to Fort Wayne

Detroit

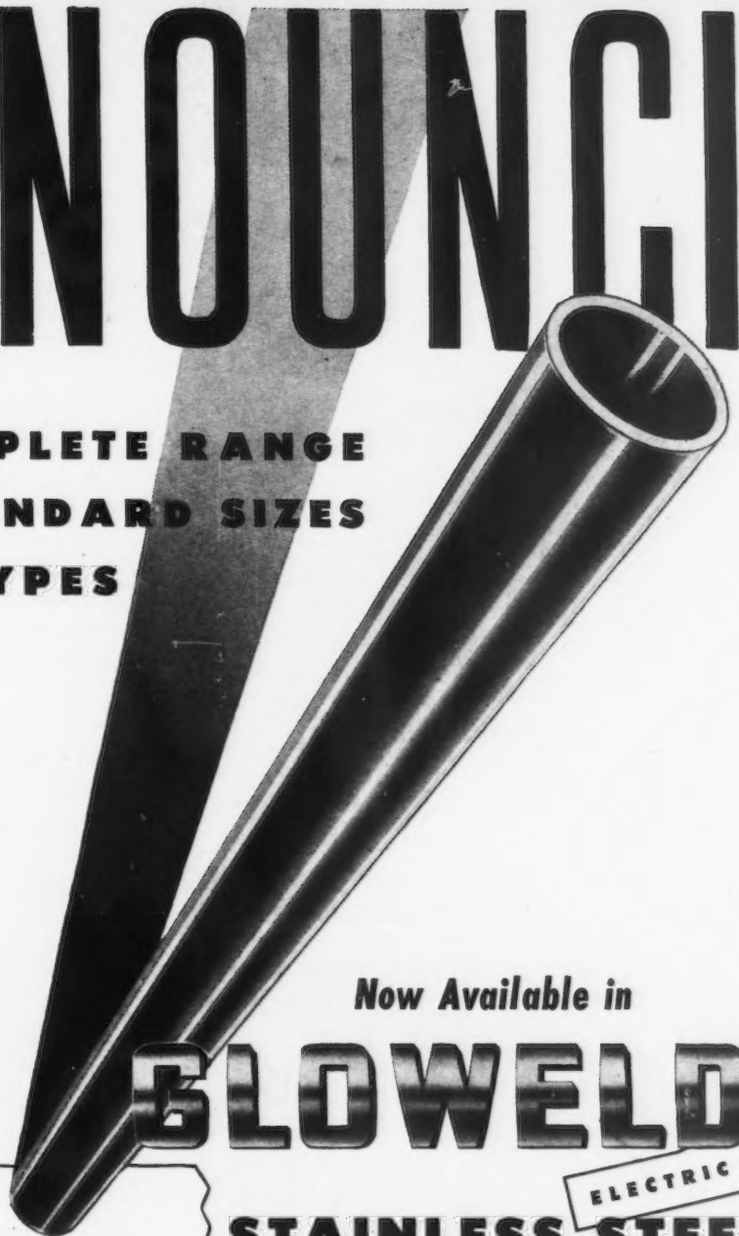
• • • **Manufacture** of approximately 200 auto and truck products now produced in Detroit will be transferred to the Fort Wayne, Ind., plant recently purchased by the U. S. Rubber Co., for $2,100,000. The plant, built in 1941 by the Reconstruction Finance Corp., was used during the war by Studebaker Aviation Corp. for the manufacture of aircraft engine gears. Buildings are modern, one-story, air-conditioned, and windowless, and are equipped throughout with fluorescent lighting. Total available floor space exceeds 400,000 ft.

Fort Wayne will specialize in the manufacture of automobile rubber parts other than tires and tubes, according to an announcement by Herbert E. Smith, president of U. S. Rubber Co. These include engine mountings for reducing vibration, steering wheels, rubber window stripping, gaskets, grommets and seals. The bulk of facilities in Detroit will henceforth be devoted to tires.

Other products to be made at Fort Wayne include rubber bonded grinding wheels, industrial adhesives, rubber covered rolls and rubber lined tanks and pipes which are currently made in Passaic, N. J., Providence, R. I. and Detroit. Vibration absorption mountings for radios, railroad and street cars, aircraft and farm implements, will also be made in Fort Wayne.

ANNOUNCING

A COMPLETE RANGE OF STANDARD SIZES AND TYPES



Now Available in

GLOWELD

ELECTRIC WELDED

STAINLESS STEEL TUBING

The ever increasing demand for a wider range of sizes and types in **GLOWELD** has prompted us to take this timely forward step. Like all other Globe Products, **GLOWELD** measures up to the same high-standard uniformity and quality.

5030

Now Available

★ **TUBE SIZES:**
⅜" to 4" O. D. inclusive

★ **PIPE SIZES: IN STD. WTS.**
⅛" — ¼" — ⅜" — ½" — ¾" — 1" — 1¼" — 1½" — 2" inclusive

★ **TYPES*:**
304 — 316 — 317 — 347

★ **FINISHES:**
Polished O. D.:
⅜" to 4" inclusive
Polished I. D.:
1" to 4" inclusive

*Other Analyses Available on Application.

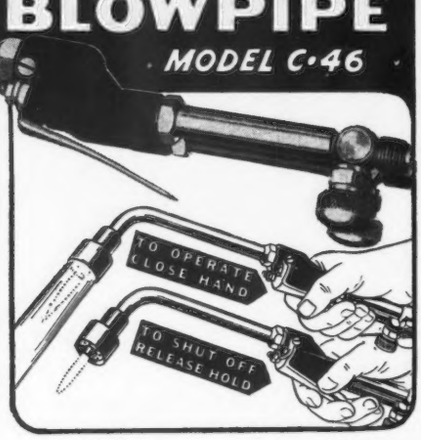
GLOBE

GLOBE TUBES

STEEL TUBES CO.
MILWAUKEE 4, WISCONSIN U.S.A.

WELDIT *Automatic* BLOWPIPE

MODEL C-46



for
- **SOLDERING**
- **ANNEALING and**
- **HEATING JOBS**

for use with—
Natural Gas, Manufactured Gas, Butane and other Low Temperature Gases and Compressed Air.

Automatic Shut-Off
Saves Gas and Air
Eliminates Idle Flame Hazards

(Can also be furnished non-automatic for continuous operation)

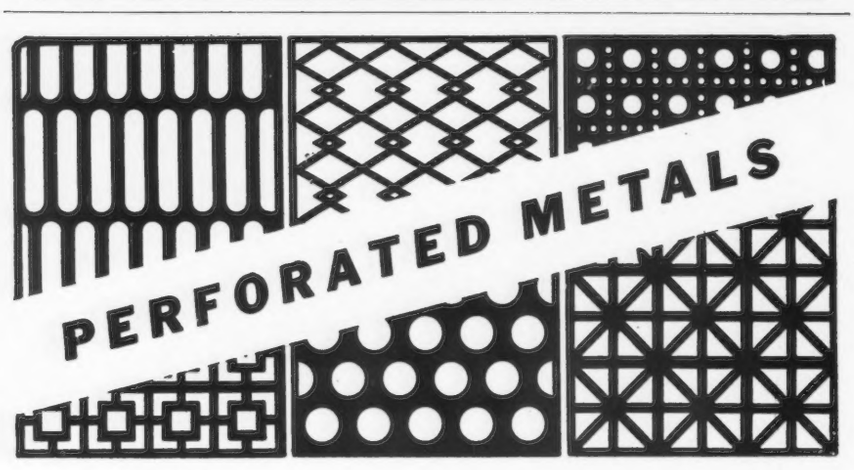
Operator's natural hold produces full working flame—releasing hold reduces flame to a very small pilot light, thus saving gas and air otherwise wasted when tool is not in actual operation. When worker again grasps the handle to resume operations, the blowpipe instantly converts to full flame at original adjustment. In addition to saving gas and air, it eliminates all danger of the full flame, with the possible accident hazards.

A sturdily built, properly balanced tool, with easy accessibility to valves and seat adjustment. Regularly used by most of the large industrial plants having a need for this type of tools.

Send for Descriptive Bulletin

Weldit INC.
SINCE 1918

992 OAKMAN BLVD. • DETROIT 6, MICH.



for every industrial use

Hendrick offers a complete line of perforated metals for every type of application, in all commercially rolled metals, any gauge or size of opening. More than 70 years experience in perforating metals, extensive plant facilities and large stock of dies and tools assure outstanding performance and long service life. May we quote you?

HENDRICK
Manufacturing Company

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and Amorgrids.

37 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Office. In Principal Cities

Steel's Safety Record Reveals Improvement

New York

• • • **The steel industry,** which, during the past 10 yr, has stood consistently near the top of the list among safe industries, moved up from fifth to fourth place during 1945, according to the American Iron & Steel Institute.

A study of National Safety Council records reveals that last year the frequency rate of accidents within the steel industry was 7.23 per million manhours of work. This was a decrease of .77 points from the frequency rate of 1944.

A dozen years ago the steel industry stood in twelth place in the safety standings of the nation's industries. In the past 8 yr, steel has ranked in third place four times, in fourth place three times, and in fifth place once.

Hand in hand with specific work safety programs, campaigns have been carried out in some plants to reduce off-the-job accidents.

The frequency average for all industries reporting to the council last year was 13.63 accidents per million hr of work. The communications, electrical and tobacco industries were, in that order, the only industries that stood higher than steel in 1945.

Surplus Committee Set Up

Washington

• • • **Establishment of** a national advisory committee to study and make recommendations on all aspects of problems relating to disposal of surplus metalworking machinery and equipment has been announced by WAA. Names of committee members will not be revealed by WAA until the complete list can be announced.

Similar committees will be established for each of WAA's 33 regional offices, it was said. No members, national or regional, will receive pay or other compensation, such as expenses.

The national committee will be representative of the contract dealers as to size, geographic location, trade organization membership and the three—manufacturers, dealers in new and dealers in used machinery and equipment.

Information Free

(1) Punches and Dies:

Complete lines of standardized interchangeable punches and dies, together with parts and accessories, and other R-B products such as bushings, guide pins, cap screws, etc., are illustrated and described in 48-p catalog. Hardness conversion tables, stamping pressure chart and other technical data are included. *Richard Brothers Div., Allied Products Corp.*

(2) Abrasive Wheels:

Development, performance and adaptability of resilient wheels for finishing and polishing, featuring ability to cushion hard grinding action is discussed in form No. 6381A. Abrasive wheels for grinding stainless alloys are covered in Form No. 8687. Specifications of wheels for use on various grinders and for different types of grinding are listed. *Manhattan Rubber Mfg. Div., Raybestos-Manhattan, Inc.*

(3) Ball Bushing:

Engineering data booklet explains operating principle and features of the ball bushing developed for linear motions. Listed are the 17 sizes ranging from ¼ to 4 in., and 20 advantages of their use. Standard dimensions, installation data and load ratings are given. *Thomson Industries, Inc.*

(4) Management Equipment:

Progressive management equipment providing record control and protection are covered in illustrated brochure. Feature items described include the Flo-film for microfilming records, Safe-T-Stak steel storage files and four types of record system procedure. *Diebold, Inc.*

(5) Contour Machining:

Technique of contour machining and its application in metal working shops is demonstrated in a booklet entitled, "DoALL Equals Ten Plus." This ready reference on machining operations is designed for coat pocket or tool chest and is a pictorial time study of metal fabricating short cuts. *DoALL Co.*

(6) Air Cylinders:

Operating data and specifications of air cylinders are presented in illustrated catalog 234 which serves as an aid in the selection of cylinders for many possible applications. Hand and foot-operated, and speed valves are shown with complete details. *Hanna Engineering Works.*

(7) Arc Welding Electrode:

Bulletin gives complete information on Type HTS, a lime-ferritic electrode designed to prevent underbead cracking in the welding of difficult-to-weld steels such as high sulfur free machining steels, high carbon steels, cast iron, etc. Tables cover data on physical properties and chemical analysis of Type HTS deposit, and actual applications are discussed. *Metal & Thermit Corp.*

(8) Organic Coatings:

Booklet covers the sources, properties and applications of the many resins used in synthetic lacquers and protective coatings. Provides assistance in answering questions on suitability of one type of coatings as against another for specific applications. *United Chromium, Inc.*

(9) Injection Molding:

Data and specifications on injection molding machines are listed in bulletin 620-D, which also illustrates the series E horizontal machines having capacities from 12 to 28 oz. and featuring flexibility and adaptability to intricate mold designs and various plastic materials. Diagrams of working assemblies are contained in bulletin. *Watson-Stillman Co.*

(10) Small Tools:

Over 200 sketches with full dimensional details illustrate the punches, dies, couplings, rivet sets, and other tools described in catalog No. 46. Offered as an aid in selecting the exact tool required for each job. *George F. Marchant Co.*

(11) Metal Cutting Chart:

Chart combines in quick-reference form complete information needed for cutting any metal by hand or power hacksaw and by metal cutting band saw. Slide setting determines feeds, speeds, teeth per inch appropriate for cutting various metals. *L. S. Starrett Co.*

(12) Internal Grinders:

Model No. 112 internal hydraulic grinder is described in illustrated brochure, Series 112, presenting also basic design features which provide rigidity and operational ease. Maximum work swing, grinding strokes and capacities are listed. *Bryant Chucking Grinder Co.*

(13) Power Transmission:

Practical power saving information, embracing complete engineering data, dimensions, rating tables and general information on design and application of the various types of cut gears, gear speed reducing transmissions and flexible couplings is contained in catalog 1000. Charts and formulas that have proven useful in gear design problems are included. *D. O. James Mfg. Co.*

(14) Aluminum Castings:

Technical data on how sound metal quality is obtained in permanent mold aluminum castings are covered in reference bulletin. Basic reasons for need of a competent permanent mold engineer or metallurgist while the part is in the design stage are given. Physical properties and composition of Permold aluminum base alloys and of sand cast alloys are listed. *Permold Co.*

(15) Silicone Insulation:

Facts about DC996, a silicone varnish which cures at ordinary baking temperatures and protects electrical equipment operating continuously at temperatures up to 350°F and subject to excessive moisture are contained in Resin Series No. 1. Practical instructions on how to apply and cure are included. Tables give properties and specifications. *Dow Corning Corp.*

(16) Rod Chart:

Selector chart in addition to listing the company's products and their suggested applications gives factual information for the welder. Bonding and remelting temperatures are listed for each alloy as well as Brinell hardness. Strength in psi of these low temperature welding alloys is included. *Eutectic Welding Alloys Corp.*

(17) Floor Machine:

Low motor carriage, side polishing brush and adjustable wheel assembly are features of the Tennant model 15 disk type floor machine described in bulletin 81.9. Illustrations show the machine in operation of polishing, scrubbing, steel wooling, and rug cleaning. *G. H. Tennant Co.*

(18) Building Maintenance:

Clear, concise description of the uses and applications of maintenance materials for floors, walls, roofs, covered in folder. Discussion of a floor resurfacer, Stonite for wall and roof, and Concretite for heavy duty floors, is included. *Stonhard Co.*

(19) Tipped Milling Cutters:

The development and advantages of multi-duty carbide tipped Jack-Lock milling cutters are given in bulletin No. 461. Shell end mills and face mills for cast iron and nonferrous metals and for steel are illustrated. Data gives dimensions and prices. *McCrosky Tool Corp.*

NOTICE TO READERS: Your request for this information will be forwarded promptly to the manufacturer issuing the literature. The offer is good for only two months.

9/5/46

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INFORMATION FREE (Continued)

(20) Static Electricity Control:

Technical bulletin No. 140.1 relates to the control of static electricity developed on drive and conveyor belts in process industries such as paint and lacquer companies, powder plants, etc., where dust is a factor. Methods of grounding the shafts are described. Film-testing and film maintenance procedures are also covered. *Acheson Colloids Corp.*

(21) Pipe Tools:

Current line of pipe equipment is listed in revised price bulletin. Descriptions with illustrations of various ratchets, cutters, heavy duty and general utility pipe and bolt machines, and other tools are included. *Beaver Pipe Tools, Inc.*

(22) Flexible Couplings:

Simplicity of design of resilient flexible couplings for driving and driven machines are stressed in bulletin SL-1000-1. Illustrations and a cutaway view of the coupling show construction features. *Crocker-Wheeler Electric Mfg. Co.*

(23) Rotary Blowers:

Operating principle and construction features of rotary positive blowers are presented in bulletin No. 22-23-B-12, covering applications for supercharging and scavenging of diesel engines, pneumatic conveying service, foundry cupola service and others. Illustrations, characteristic curves, and cross-sections of the units are included. *Roots-Connersville Blower Corp.*

(24) Free-Machining Aluminum:

Bulletin 55-B describes R317 aluminum alloy which combines free-machining qualities with high strength and heat treating characteristics of the Dural type alloys. Mechanical properties, resistance to corrosion, heat treatment and forging temperatures are given. *Reynolds Metals Co., Inc.*

(25) Milling Planer:

Construction features of a milling planer which can plane and mill, bore or drill without changing the setting of the job is described in bulletin 52. Models of openside and double housing type planers with combination of milling and planing heads are shown. Classes of work best suited to the milling planer are suggested. *G. A. Gray Co.*

(26) Arc Welder:

Folder describes a 200-amp. gas engine drive, simplified arc welder, with its polarity control, cooling, oversize 4-pole exciter, and multi-range dual control units illustrated. The welder is stationary type or can be mounted on a trailer or truck for jobs in the field. *Hobart Bros. Co.*

(27) Duplicating:

Catalog No. 46-10 summarizes developments in Di-Acro system of dieless duplicating, giving complete descriptions and illustrations of the latest models of Di-Acro precision machines which include benders, brakes and shears. Applications of this equipment to various production jobs are also presented. *O'Neil Irwin Mfg. Co.*

(28) Centrifugal Pumps:

Electropumps, a line of centrifugal pumps ranging in capacity from 40 to 900 gpm with heads up to 200 ft and higher are described in bulletin No. 200. Details of the hydraulic design emphasize efficiencies in excess of 80 pct for pumps as small as 2½ in. *Carver Pump Co.*

(29) Thread Gages:

Series of pamphlets explains types of thread gages, listing size ranges, specifications and other technical data. Quality control, inspection, purchasing thread products, screw threads and their gages are several of the subjects discussed. *Johnson Gage Co.*

(30) Raw Materials:

Handbook lists analysis and quality of raw materials for the metallurgical, ceramic and chemical industries, including Lake Superior iron ores, fluorspar, ferroalloys. Coal, phosphate rock and hot top are included and chapters are devoted to statistics on Lake transportation vessels and docks. *Oglebay Norton & Co.*

(31) Automatic Press Feed:

Heyman semi-automatic press feeding unit, which substitutes for the operator's hand in placing pieces in the die described in folder. In addition to assuring complete safety for operator, device is said to increase production substantially and eliminate expense due to smashed dies and lost production due to ram descending on fouled die. *Covert Mfg. Co.*

(32) Drill Presses:

Series of bulletins in catalog 60 presents design and construction features of various precision built drill presses, full anti-friction bearing equipped. Models described include floor and bench type, of single and multiple spindles, box type column drills, sliding head motor driven, 8-speed motor spindle radial drill, and others. *Canedy-Otto Mfg. Co.*

(33) Heat Treating Stainless:

Data chart condenses heat treating procedure for 24 grades of stainless steel, giving salient information of preheating, hardening, quenching, stress relieving, tempering, and annealing. Precautionary advice for best results is included. *Peter A. Frasse & Co., Inc.*

(34) Presses:

Illustrated pamphlet presents features and use of the 4, 6 and 8-ton capacity, manual, automatic and vibratory Multipresses designed for pelleting, coining, blanking, drawing and forming, transfer and die marking; for plastics, precious metals, etc. Accessories and 81 typical examples of work performed on these hydraulic presses are listed and illustrated. *Denison Engineering Co.*

(35) Zinc Bright Dip:

Folder discusses Luster-on, an inhibited zinc bright dip for automatic or hand plating cycles. The hand-operated cycle procedure is presented in detail, from the plating tank to the drying. *The Chemical Corp.*

(36) Centrifugal Pumps:

Two stage centrifugal pumps, designated as class GT, and described in form 7062, are 2200 gpm capacity units for discharge heads up to 1050 ft (450 psi). Cutaway views illustrate types of drive and typical installations. Tables give performance, dimensions and pipe friction. *Ingersoll-Rand Co.*

(37) Metal Cleaning:

Leaflet describes steel cleaners made for electroplaters and outlines a typical cycle for low carbon steel processing. Solvent emulsion-type pre-cleaners, solvent-alkali combination for precleaning, alkaline soak tank cleaners, alkaline electrocleaners and acid type descaling products are discussed. *Pennsylvania Salt Mfg. Co.*

(38) Plastics:

Thirty-six page booklet, "The ABCs of Modern Plastics," provides a brief outline of the origin, preparation, and uses of plastics, and their importance to modern living. Complex technical processes are described in terms of everyday living and further explained in colorful charts and lively illustrations. *Bakelite Corp.*

(39) Precision Casting:

Brief outline of industrial precision casting process is given in booklet, "Fundamentals of Industrial Precision Casting." Deals primarily with the fundamentals involved in producing an accurate and dense casting. *Kerr Dental Mfg. Co.*

(40) Stainless Steel Electrodes:

Complete information on the selection and application of stainless electrodes for welding stainless steel is contained in booklet. Current range is furnished for each type of rod in varying diameters. *Jessop Steel Co.*

(41) Elastomers:

"Engineering with Sirvene" is the title of an illustrated monograph dealing with the characteristics and properties of Sirvene compounded elastomers and their application in the engineering of new products. *Chicago Rawhide Mfg. Co.*

(42) Industrial Equipment:

Production equipment designed and developed by Mahon engineers to meet special requirements is dealt with individually and in detail in pamphlet. Illustrations show units of typical finishing systems, metal cleaning and rust proofing installations, spray booths, drying and baking ovens, and dust collectors. *The R. C. Mahon Co.*

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Wrench Makers Adopt Simplified Standards

New York

• • • **Manufacturers of** carbon and alloy steel open end and box wrenches have adopted a series of simplified practice recommendations through the regular procedure of the National Bureau of Standards, which it is believed will result in a more rounded and efficient line of wrenches to meet the requirements of users in every type of industry.

The new recommendations provide for the elimination of 85 superfluous items, bringing the total down to 255, without inflicting any hardship or inconvenience to users. Those which were eliminated represented excessive variations which had crept into the line over a period of years, and for which there was little or no demand.

In working out the simplified practice recommendations, provision was made for wrenches to fit every known size of bolt, nut, cap and set screw in each of the various standards in use in this country. All alloy and carbon double head, open end, and box wrenches are covered, with the exception of small ignition or electrical wrenches, midget type box wrenches, tappet wrenches, brake wrenches, and similar items having openings that are not based on standard bolt sizes.

The government printing office will shortly have printed copies available of Simplified Practice Recommendation R220-46, which comprises the new list of wrenches. These may be obtained at 5¢ per copy from the Superintendent of Documents, Government Printing Office, Washington, D. C.

Watches UNRRA Moves

Washington

• • • **CPA is keeping** a close watch on some $22 million worth of machinery and equipment scheduled by UNRRA for procurement and export to aid in the rebuilding of homes in Europe and Asia. Officials said that when such exports were found to be hampering veterans' housing UNRRA would be requested to postpone procurements until domestic needs are met.

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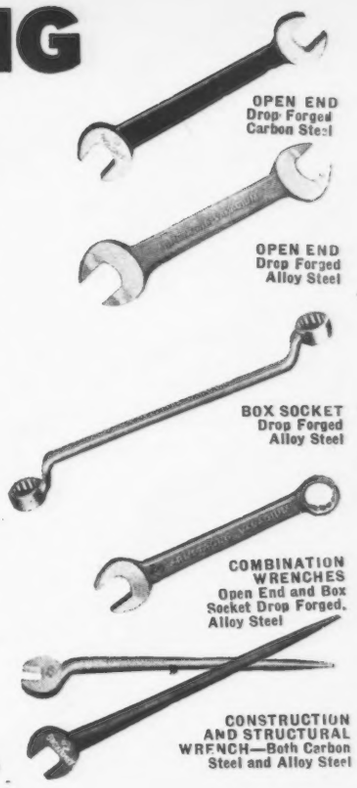

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Saar Coal Mines Under French Management Average 24,000 Tons Daily

Paris

• • • **The unofficial** re-entry of Gen. de Gaulle into the French political scene with his speech at Bar-le-Duc, in which he pointed up the French position in regard to the integration of the Saar coal basin with the French iron mines, calls attention to the reconstruction progress of the coal, iron and steel industries in the Saar under French occupation since July 1945.

When the French Military Government took over the administration of the Saar coal mines, seven of the 18 were in operation, producing 9485 metric tons per day and employing 12,000 miners in comparison with 33,000 in 1938. At present all of the mines are operating and are producing a daily average of 24,000 tons. Coke production in February this year averaged 1440 tons per day in comparison with 635 tons in July of 1945.

The coal resources of the Saar have been estimated by the Prussian Geological Institute at 3.2 billion metric tons. The maximum production during the war has been 16,241,000 tons in 1943-44, or 6 pct of the total German coal production, and the coke production amounted to 3,543,000 tons, or 6 pct of the German coke output. These figures indicate the value of the Saar coal supply to French economy.

As far as the iron and steel industry is concerned, French steel firms are vitally interested in this territory. Dillingen Huttenswerke is controlled by the big French group, Marine and Homecourt; Burbacher Hutten is a subsidiary of the Luxemburg company, ARBED, where there are important French interests; St. Ingbertwerke is controlled by the Luxemburg company, HADIR, a subsidiary of Marine and Homecourt; the Brebach works is controlled by the French firm, Pont a Mousson. The French Military Government has seized the Volklingen works, formerly owned by the president of the Reichsvereinigung Eisen who was one of the leaders of the Nazi party.

The table at the bottom of the page shows comparative figures (quoted in metric tons) of the chief iron and steel works in the Saar; percentages of the total German production are given.

Production of iron and steel ceased in July 1945, two mills were destroyed, and the coke plants were in bad condition. In December 1945 one blast furnace was relighted under French management at Volklingen, and the corresponding basic bessemer converters, and in the following month the mechanized mill at Dillengen began to operate again with a monthly capacity of about 4500 tons. At the end of May last there were two blast furnaces and two steelworks in operation. The May production figures compared with those for April are as follows (in metric tons):

	April	May
Volklingen:		
Pig iron	13,845	17,800
Steel (Thomas)	12,330	15,700
Rolled products	9,970	13,600
Dillengen:		
Steel (openhearth)	4149	6560
Plates	....	1520
Sheets	....	3440
Total rolled products	3167	4960

Total Saar Production

	April	May	Increase
Pig iron	13,845	17,800	28 pct
Steel	16,481	22,260	35 pct
Rolled products	13,154	17,960	37 pct

Three important wire mills are in operation, with production in May of 1200 tons at St. Ingbert, 400 tons at Luisenthal, and 67 tons at Rochling. The Rochling works is also producing about 380 tons of cold-rolled strip per month. The Mannesmann tube mill at Bous, which has been taken over by the French Military Government and repaired, is producing about 2000 tons monthly, and the Hombourg tube mill 1000 tons of welded tubes.

Iron and Steel Output in the Saar—In Metric Tons

	1934	Pct	1937	Pct	1944	Pct
Pig Iron	1,825,665	20	2,186,565	13.7	2,500,000	12
Steel	1,950,000	16	2,350,000	12	2,750,000	10
Rolled products	1,445,899	16	1,824,754	13	2,000,000	11

Norway Planning Own Integrated Mill With 200,000-Ton Capacity

Paris

• • • **The Norwegian** Government has decided to study the possibility of building an iron and steel works and has advanced 30 million crown ($6 million) for the preparatory work. The present proposal is for an initial capacity of 200,000 metric tons of ingots annually with adequate provision for expansion to 335,000 metric tons at a later date. The larger figure roughly approximates the prewar Norwegian domestic consumption.

While it is probable that these facilities will not be erected for several years, it seems definite that despite a complete lack of coking coal Norway will eventually have a big integrated steel plant. As previously reported in THE IRON AGE, Sweden will expand its steel capacity in the near future, and some reports here indicate that Russian help will be offered to the small Finnish steel industry in order to accelerate deliveries to that country as reparations.

In the past Norway has always depended upon imports of steel with the exception of a small tonnage of certain alloys. There has been some production of pig iron in electric furnaces, and Norway has historically been an important exporter of ferroalloys. Prewar Norwegian ore exports went primarily to Germany and England. Norwegian iron ore resources are estimated as follows in millions of metric tons:

	Iron ore	Iron content
Mines being worked.....	367	124
Fields not mined.....	545	125
Probable resources.....1000		?

Production of the main mines in 1938 was as follows:

	Iron ore	Concentrate
A. S. Sydvaranger.....1,867,702		940,197
Dunderland Iron Ore Co.	388,172	155,300
Fosdalens Bergwerks A.S.	423,821	196,696
A.S. Rodsand Gruber...	143,030	47,266
A.S. Ofoten Jernmalm-gruber	248,988	53,894
A.S. Titania.....	168,599	59,724

The A.S. Titania Co. at Frederikstad, which was associated with the American company, National Lead Co., exploited titaniferous iron ore which was used for the production of ferroalloys.

The production of iron ore concentrate was 914,000 metric tons in 1936; 1,075,550 in 1937; and 1,474,480 in 1938. No wartime pro-

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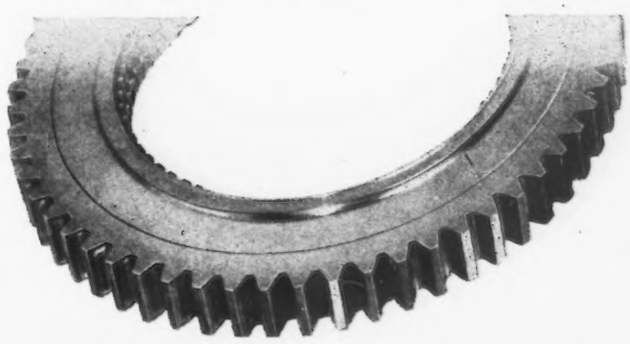

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duction figures are available, but it is known that the occupying forces made every effort for increasing production and export to Germany. Of the total production in 1937 of 1,075,550 tons of iron ore, the Norwegian works used only 100,000 tons for the production of 36,084 tons of pig iron and 145,154 tons of ferroalloys. The bulk of the ferroalloys output was exported.

In 1936 Norway exported to Great Britain 4936 tons of vanadinite pig iron, 1580 tons of spiegel and ferromanganese, 16,290 tons of ferrosilicon, 5747 tons of ferrochrome, 7775 tons of silicomanganese, and 269 tons of other ferroalloys. Great Britain also imported from Norway during the same year 285 tons of special steels and 435,000 tons of iron ore.

Germany imported 1500 tons of Norwegian pig iron in 1937, 10,000 tons of ferrosilicon, 2600 tons of ferrochrome, and 509,700 tons of iron ore. Sweden imported in 1937, 3000 tons of pig iron, 4800 tons of ferromanganese and spiegels, and 1327 tons of ferrochrome. In 1936 the United States imported from Norway 2653 tons of pig iron, 20,781 tons of ferromanganese, 1500 tons of ferrosilicon and 158,344 tons of iron ore.

In 1937 Norway imported 382,872 metric tons of iron and steel products as follows:

Pig iron	24,572
Joists, bars, etc.	174,000
Strips	17,000
Sheets and plates	94,300
Wire	38,000
Tubes	35,000
Total	382,872

The capacity of 200,000 to 335,000 tons proposed for the new steelworks seems reasonable in view of the prewar consumption and the necessary reconstruction following war damage. A steady rise in Norwegian industrial production is reported. With employment up to normal and a ready market for most manufactured goods, Norwegian industry is slowly emerging from the effects of the occupation.

By April 1, 1946, 1,450,000 gross tons of new Norwegian merchant shipping had been ordered for delivery within the next 5 yr to replace war losses. German ships are to be sold to Norwegian shipowners as reparations at an estimated figure of $5,560,000. Norway will thus be able to compete again in international shipping. It is possible that the government intends to use the new steelworks to supply the dockyards which will be participating in the reconstruction of the Norwegian fleet.

The total cost of the new steelworks is estimated at 206,000,000 crowns ($41,200,000) and it could be built in about 3 yr. As in the case of the new steelworks of Norrbotten in Sweden, the state will participate in the plan for erecting the steelworks and in their operation when they are built.

ASTE Announce Plans For National Meeting

Detroit

• • • **The American Society** of Tool Engineers announced through its president, A. M. Sargent, preliminary plans for the largest semi-annual national convention in the society's history to be held at Pittsburgh, Oct. 10-11-12, 1946. Convention headquarters will be the Hotel William Penn where the entire 17th floor has been reserved for scheduled activities.

Seminars on timely technical subjects, visits to industrial plants employing new production techniques, and showings of engineering films are on the convention agenda, according to Sargent.

Technical sessions tentatively lined up open Thursday afternoon, Oct. 10, with Stephen Urban of Pratt & Whitney, Syracuse, chairmanning a meeting devoted to "Welding and Design," followed in the evening by "Gas Turbine Tooling and Production," directed by Robert W. Ford of Ex-Cell-O Corp., Pittsburgh.

Friday morning, afternoon and evening sessions will treat "Precision Castings," "Tooling with Carbides," and "Manufacturing Analysis," with H. E. Linsley of THE IRON AGE, E. W. Baumgardner of National Carbon Co., Cleveland, and O. W. Winter of Acme Pattern & Machine Co., Buffalo, in charge, respectively.

On Saturday morning, Fred L. Schmitt of D. A. Stuart Oil Co., Chicago, will conduct the final lectures, dealing with various phases of "Multiform Grinding."

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British Debate Ruhr Steel Nationalization; Now Running at Loss

Dusseldorf

• • • **No decision** has yet been reached in the British zone of occupation as to whether the German steel industry in the Ruhr is to be nationalized, and expert opinion here is mixed as to the probability of such action. While high opinion in the Labor party in London believes in steel nationalization, the enthusiasm wanes slightly as the administration gets closer to the steel industry itself. The prospective economic unity between the American and British zones is making more important the recognized American antipathy to nationalization, and this factor will make nationalization plans more difficult to consummate.

There is a group of younger steel men without financial interests in the companies who are firmly convinced that nationalization is the best recourse in existing circumstances, and they are increasing their influence. This group is determined that the industry shall break away from prewar traditions, and that the step should be taken forthrightly, rather than being allowed to transpire by indirection. There is a feeling among some British officials that the nationalization step is actually coming to pass at present due to operating conditions, but the younger men in the industry feel that nationalization should be adopted on its merits.

General agreement is to be found everywhere that the industry, due to the low operating rate and fixed prices, is operating at a loss. The industry has never had a price increase since before the war, and although an effort has been made to obtain one recently on the basis of increased costs due to the use of low grade ore, this question is now deferred until 1947. Military government officials are determined not to grant a steel price increase that would start an inflationary spiral in goods-starved Germany. No one is sure, however, just how much money the steel industry is losing—high British officials estimating 12-15 million marks per month, perhaps a billion since the end of the war.

These losses have to date been

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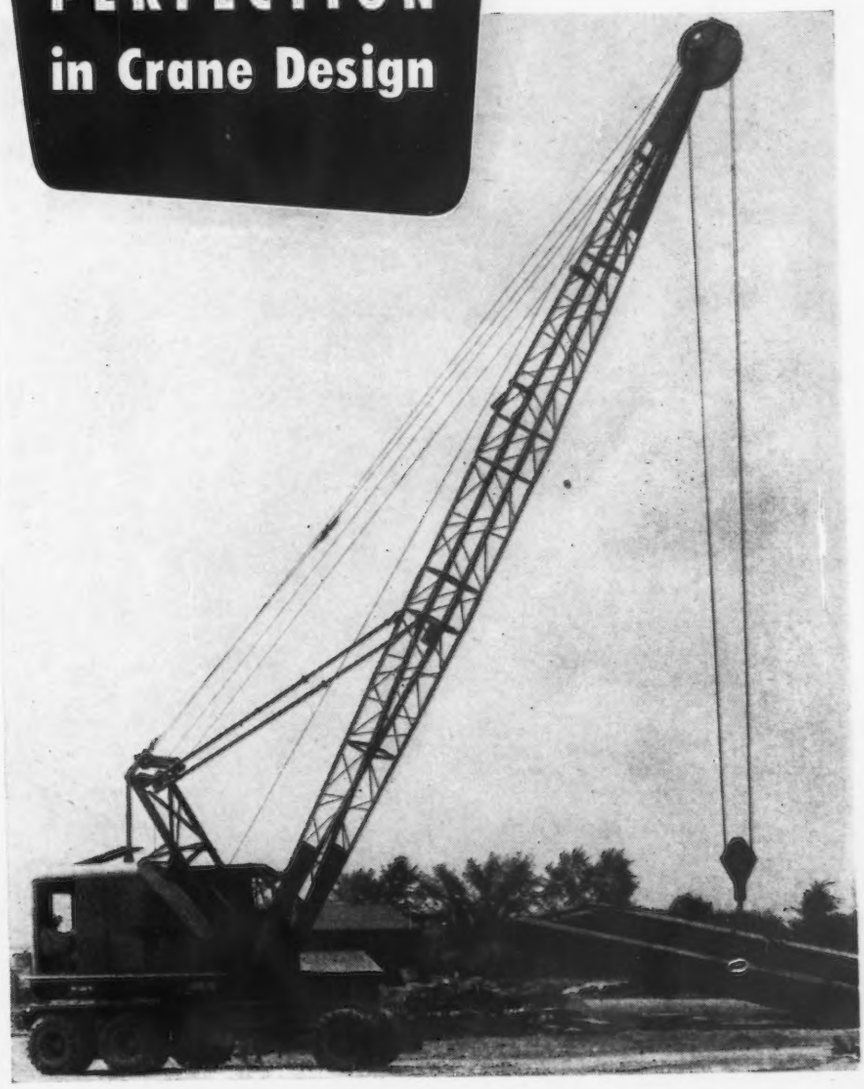

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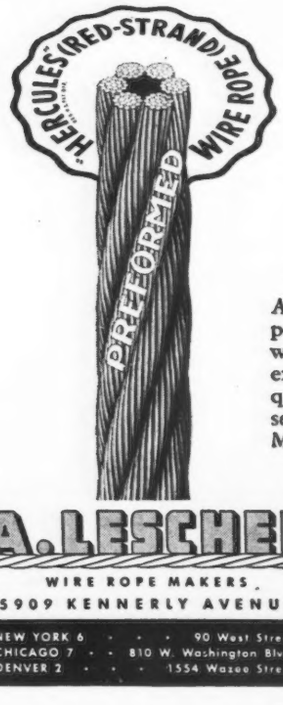

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largely covered by reserves, but they cannot be much longer. If the British estimate is correct, the enormous losses will soon place the steel industry in the hands of the German government bank, the Reichsbank. Credits are being arranged at present, since the military government favors them in place of the heavy subsidies that might be used in place of loans, but opinions vary as to just how desperate the companies are financially.

One undeniable asset that all of the firms possess in varying quantities is in stockyards of raw and semifinished steel. The men who investigated the German steel industry a year ago for the Allied forces noted the extensive stocks, and suggested that the steel industry might have been almost sabotaging Germany in the final stages of the war by building such stocks deliberately, and limiting finishing operations where possible.

Whether the German industry has tried in the past year to hold on to their stocks, there is at least a motive present for so doing. With the German mark in such an extremely unstable position, and most Germans certain that it will ultimately be replaced by some other currency, ingots in a stockpile are the nearest thing a steel firm can get to gold. Certainly they are much more desirable than marks in a bank account.

In a measure, the stocks that existed a year ago are still to be seen, here, and in the other cities of the Ruhr. In a recent action the military government is attempting to force the steel firms to use up as much as possible of these stocks, as finished steel is so urgently needed for reconstruction work. Present practice is for each firm that is in operation to get a quota for pig iron, ingot and finished steel production. The finished steel quota for the last two months has specified the rolling of a certain amount of material from stocks. Pressure now is to get the stocks that are to exist into merchant's hands as a potentially useable product, rather than lying in yards as ingots.

To accomplish its ends in steel production, the British military government was faced with a difficult problem. The top layer of heavy industry men were removed

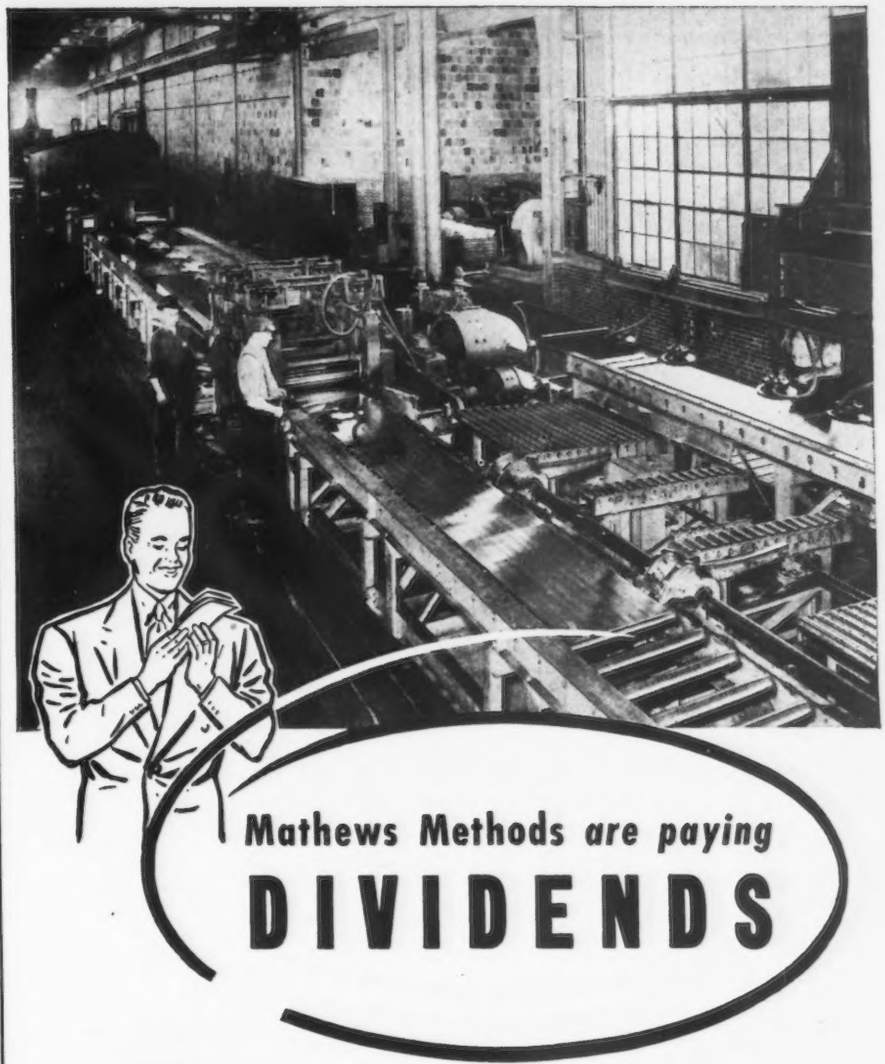
for political reasons. The Potsdam decree dictated that the domestic steel cartel, along with all others, should be eliminated. Some new organization had to be built up to replace the former group and work with the military government.

For this purpose the British administration started to work with the professional technical society of steel men. Gradually over the past few months they have developed from it, by the addition of certain departments, a group that functions to direct the steel industry under military government orders. At the head of this organization is Max C. Muller. This organization will now be separated in function from the technical society, which will resume its former position.

As far as operations in the steel mills themselves are concerned, they go on under the military government much as does a steel mill anywhere. At the mills themselves there are no military authorities to be found, although a foreigner needs to get visiting permission from the central steel headquarters of the military government as well as a pass from the local or regional officer before entering. As a memory of bygone visitors, the passes generally note that no permission to carry off equipment or records is given or implied.

Despite what must have been a wearying round of American, British and French visitors, the plant directors go on personally conducting their imposed guests, and describing in great detail what happened to each plant and brick during the war. At the Mannesmannrohrenwerke at Huckingen, just outside Duisburg, it is difficult to sort out the postwar facts, because the war is so predominant in every mind. The peak capacity of this plant was 75,000 metric tons of ingots per month, of which 45,000 tons was openhearth steel, 24,000 tons Thomas basic bessemer, and 6000 tons of electric steel. The firm now has the required permits to operate all departments except the electric furnaces, and is currently operating at a rate of about 25,000 tons per month.

The plant started operation in November of last year with two blast furnaces and two openhearths in operation, but one of the blast furnaces was later closed



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due to a lack of fuel. According to the manager of the plant the changeover from the use of hot metal in the openhearths to the heavy scrap charges of today has cost heavily in output per furnace. The use of low grade German ores in place of the Swedish ores for which the plant was adapted is also increasing costs. The manager states that coke consumption is up from about 800 kilos per ton of iron to 1000 kilos using a 40 pct scrap charge, and would go to 1400 kilos if the scrap charges were reduced.

There are about 3000 workers at the plant at present, of a normal 6000. Production per man has dropped, according to the manager from 12 tons per man month to between 5 and 8 tons. One of the chronic difficulties to be found in every plant is the shortage of refractories material. Most of the German production came from what is now the French zone, and the British authorities have been experiencing difficulties in obtaining it from the French.

The No. 1 blast furnace at this plant is presently being relined, as and when the labor is available to carry on the work. Material is available on the site. Some fame has collected around this furnace as it is reputed to have operated from 1929 to 1945, making 3,100,000 tons of iron, without relining.

During last year the firm was permitted to trade a certain amount of its basic bessemer slag fertilizer direct to farmers in exchange for food for its workmen. This practice has now been banned by the military government, but the firm is still using up some food stocks that it built up at that time. The practice has been to give about 1900 workmen an extra hot meal, consisting of some type of soup, that added about 700 calories to the basic ration. The food stocks are about exhausted, and the manager suggests that the meals will probably stop in two or three weeks time. In the meantime the basic rations of fats and sugar for the Germans in the British zone have again been cut during July, and the effect of this step will be hard to predict. Meat and bread rations were increased at the same time, so the expected drop in production may be negligible.

At the GHH works at Oberhausen, just outside Duisburg, the

production has been controlled over the past year by a shortage of coal. This entire firm is now employing about 16,000 workmen at all its plants, compared with 30,000 before the war. The plant received a fair amount of war damage, most of which occurred in the course of a single raid, but there are still ample facilities to produce at far beyond the present rate. This plant started operations of a sort very quickly after the Ruhr was occupied, but the operation consisted only of lighting a single blast furnace to furnish power.

Operations have expanded gradually from this modest beginning until a fairly complete product line is presently in production. The firm is expecting to run into serious labor trouble in the autumn, as are most of the other producers. The August production schedule will require 600 new employees, and the September program 1000 more. The works manager states frankly that he does not expect to get them.

The August and September programs for this plant give a fair idea of the distribution of operations for one of the large producers at present:

For August, pig iron production should be 30,000 tons, Thomas steel 26,000 tons, and openhearth steel 14,000 tons.

The breakdown of rolled products for September, in metric tons, is as follows:

Semis	6000
Sections	1500
Rails	5000
Plates (heavy)	4000
Plates (med.)	3000
Sheets	1500
Wire products	3000
Ry. tires	1500
Castings, forgings	300

The Mannesmann tube works at Rath, just outside Dusseldorf is now employing about half of its prewar payroll and is producing at about a third of prewar capacity. The automatic seamless tube mill that was the pride and joy of the mill before the war has not yet been repaired, and all operations are at present on the older mills. Most of the remainder of the plant has already been repaired, at least as far as machinery is concerned, but the repair to the roof damage, which was extensive, is proceeding slowly, and is consuming considerable amounts of tubular products in the framework.

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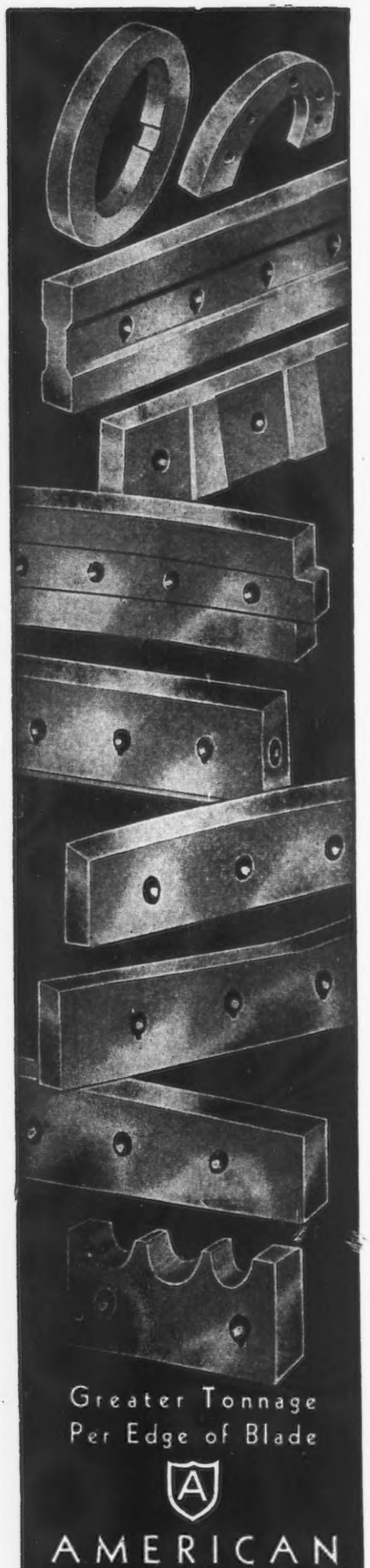


Farm Implement Output In Canada Up 7.3 Pct

Ottawa

• • • **Production** by the farm implement and machinery industry of Canada was 7.3 pct higher in value in 1944 than in 1943 and 37 pct above the 1942 total, according to the Dominion Bureau of Statistics. Actual value (at factory prices) for these years were as follows: $61,098,793 in 1944, $56,952,569 in 1943 and $44,678,078 in 1942. Output of farm equipment in this industry amounted to $25,342,538 in 1944, $18,429,964 in 1943 and $19,087,554 in 1942. In other industries there was a small production of farm implements amounting to $954,000 in 1944, $500,000 in 1943 and $550,000 in 1942.

During 1944 there were 39 factories listed in the farm implement industry, of which the majority, 25, were located in Ontario.

Canadian Steel Production and Shipments

Toronto

• • • **Canadian steel mills during May produced 245,894 tons of carbon and 13,766 tons of alloy steel ingots and castings. Shipments of primary shapes in May totaled 270,061 net tons compared with 248,381 net tons in April. The May shipped tonnage included 47,738 tons of semifinished; 16,336 tons of structurals; 18,652 tons of plates, 25,998 tons of rails, 7645 tons of track materials; 50,091 tons of bars; 13,152 tons of pipe and tubing; 21,963 tons of wire rods; 19,471 tons of black sheets; 6153 tons of galvanized sheets; 558 tons of tool steel; 7355 tons of castings; and 34,929 tons of miscellaneous items.**

During May, Canada imported from the United States 1778 tons of pig iron, compared with 2475 tons in the preceding month. The following tables show Canadian production and shipments in net tons for the first five months of 1946:

Five Months Ended May 31, 1946	Carbon Steel		Alloy Steel	
	Made	Shipped	Made	Shipped
Billets, etc., for forging	24,403	25,795	1,200	1,768
Other semifinished shapes, not for rerolling	136,759	150,515	527	510
Structural shapes and piling	63,807	64,881	.....	.....
Plates	92,054	88,551	6	.....
Rails	145,844	151,920	.....	.....
Tie plates and track material	38,605	40,236	.....	.....
Tool steel	1,088	983	1,015	1,001
Hot rolled bars for forging	26,412	24,675	11,456	11,304
Concrete reinforcing bars	21,195	20,184	.....	.....
Hot rolled bars for cold finishing	5,219	5,389	6	6
Other hot rolled bars	158,975	156,159	11,460	10,731
Pipes and tubes	59,953	65,691	.....	.....
Wire rods	115,254	117,003	89	83
Hot rolled black sheets	69,396	66,936	.....	.....
Cold reduced black sheets	8,981	8,981	.....	.....
Galvanized sheets	33,285	32,032	.....	.....
Steel castings—by ingot makers	23,018	23,000	6,815	6,202
by other foundries	10,177	8,970	184	169
All other shapes, including tinplate, tin mill blackplate, cold finished bars and strips, etc.	157,484	156,227	657	655
TOTAL ALL PRODUCTS	1,191,909	1,208,128	33,415	32,429

Producers shipments of primary iron and steel, including steel castings shipped by all foundries for the five months ended May 31, 1946, in net tons, subdivided according to principal consuming industries are as follows:

	Carbon Steel	Alloy Steel
Automotive industries	23,656	17,171
Agricultural, including farm machinery	45,192	612
Building construction	75,052	181
Containers industry	75,414	42
Machinery and tools	38,222	3,010
Merchant trade products	117,507	229
Mining, lumbering, etc.	30,932	2,721
National defense	770	3
Pressing, forming and stamping	38,282	460
Public works and utilities	11,567	235
Railway operating	191,596	1,252
Railway cars and locomotives	76,830	1,408
Shipbuilding	24,078	134
Miscellaneous and unclassified	12,214	298
Wholesalers and warehouses	125,435	1,182
Producers' interchange	226,811	890
Direct export—To British Empire	62,284	432
To other countries	32,286	2,169
TOTAL SHIPMENTS	1,208,128	32,429

University of Iowa Plans 10-Day Course In Quality Control

Iowa City, Iowa

• • • **An intensive** 10-day course in "Quality Control by Statistical Methods" is announced by Dean F. M. Dawson of the College of Engineering and chairman of the committee on quality control, and by Dean Earl J. McGrath of the College of Liberal Arts at the State University of Iowa. The course will be given Oct. 15 to 25 inclusive at Iowa City, Iowa.

These statistical methods of quality control as developed by some of the nation's leading industries, with the cooperation of the Army and Navy and other governmental agencies, have shown startling results in:

Aiding in the conversion from production of one type of product to another.

Improving quality of purchased materials.

Economies in use of labor and materials.

Improving quality of final product.

Decreasing rejections.

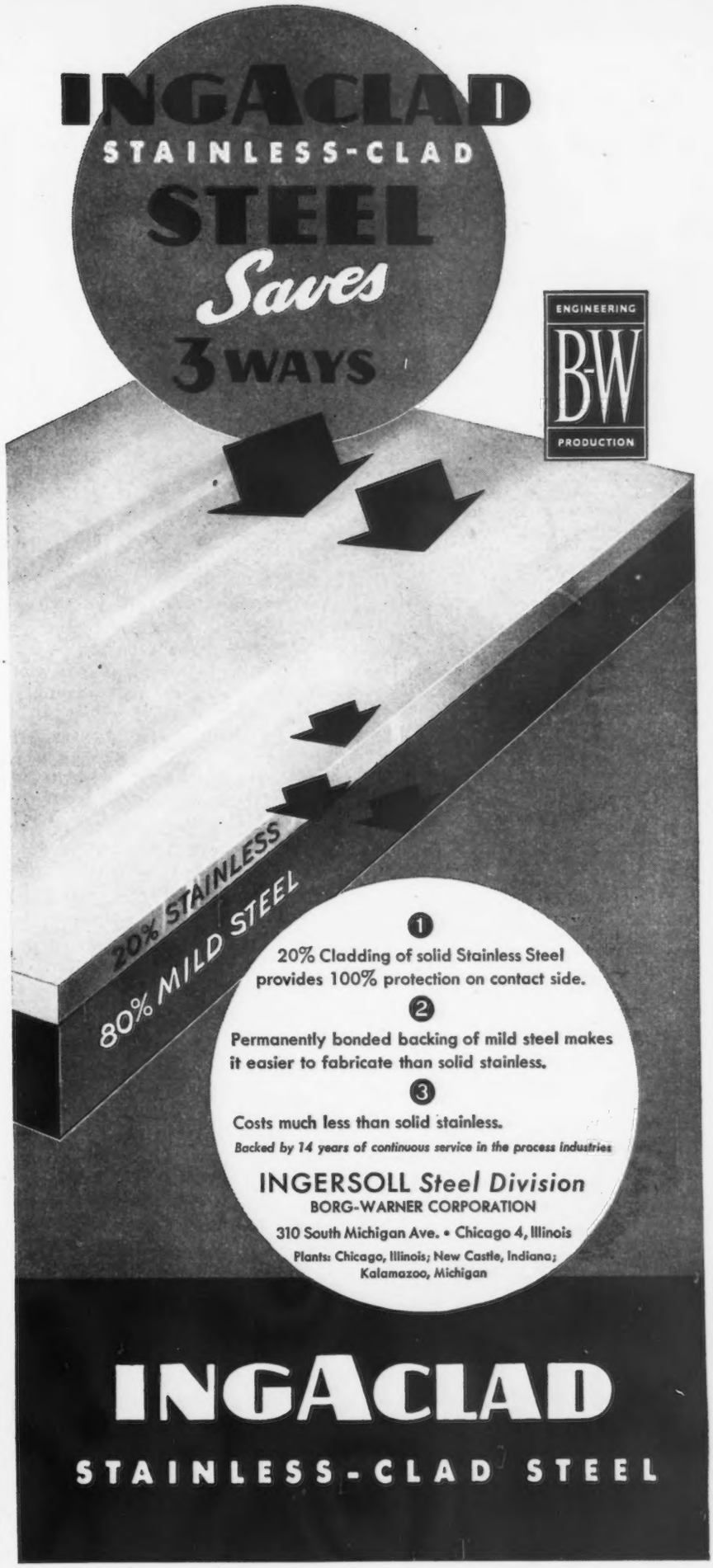
Decreasing inspection costs.

Improving producer-consumer relations.

This is the fourth course offered by the University of Iowa. Representatives of industry from 17 states and officers and employees of the Armed Forces have attended the previous courses held in October 1944, May 1945, and November 1945. Many more would have attended, it is said, had additional facilities been available.

A feature of the proposed course is the follow-up program in which two 2-day clinics will be held with the industrial representatives to discuss common problems and to obtain additional information.

Applications by trainees of previous courses held at Iowa are being used in industries such as: aircraft, chemicals, clay products, drugs, electrical equipment, farm machinery, foundries, glass, mail order, metal working, optics, paper, plastics, radio equipment, rubber, small arms, steel, surgical dressings, telephone, textiles, and tools. "Fundamental principles are the same; applications vary," the university states. Trainees of



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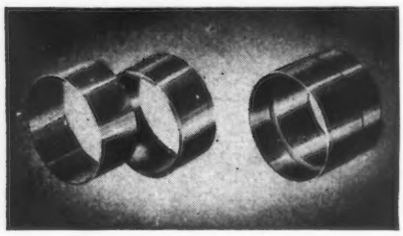

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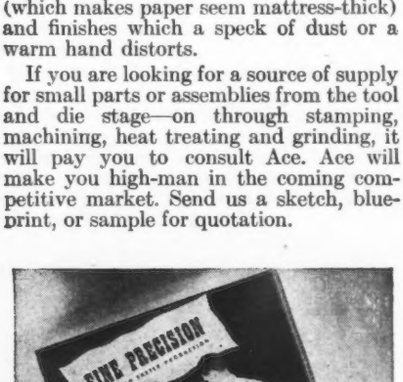

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the course have used the principle in plants having over 5000 employees producing several thousand items per day and in plants having 6 or 7 employees producing less than 40 items per day.

It is a permanent development; new uses are being discovered constantly and additional concerns are making use of it as more individuals are trained. It has proved to be particularly desirable when applied to new lines of production and where it is necessary to utilize inexperienced labor.

Two of the basic principles underlying the theory of quality control by statistical methods are variation and measurement. It is recognized that no two things are made or manufactured to be exactly the same. The differences between any two articles may be small but they do exist and it is immaterial in the course as to the refinement of the differences. It is also recognized that the variation can be measured in some way. This measurement does not necessarily mean length or width. It may mean such things as the number of stitches per inch of seam, the number of pin holes in a paint job, the number of defects per square inch of cloth, the tension of a spring, the life of a bulb, the pull on a rope or cord without breaking, the number of letters misfiled, the percentage of errors on a production line, or the number of pieces produced per unit of time.

One of the fundamental principles of quality control by statistical methods is to undertake to build quality into the product by keeping the various steps in the process within control.

The program consists of a series of conferences, lectures, and laboratory periods lasting from 8:30 a. m. to 5:00 p. m. each day except Sunday. General lectures will be given to the entire group. The trainees will be divided into small sections under the direct supervision of an instructor.

The course is designed for executives and persons in an advisory position where the knowledge gained can be applied immediately. It is particularly valuable to quality control supervisors, managers, industrial engineers, production engineers, designing engineers specifying manufacturing limits, those in charge of specifications for materials and personnel responsible for incoming materials.

The tuition for the course including books and supplies is $100. Trainees will be expected to provide for their own living expenses and transportation to and from Iowa City. The number of trainees in the course will be limited.

The university suggests that those desiring to submit nominations for themselves or for representatives of their organization to attend the course in October or those interested in additional details write directly to either Professor Earle L. Waterman, College of Engineering, or to Professor Lloyd A. Knowler, Department of Mathematics, State University of Iowa, Iowa City, Iowa.

Pig Iron Output In U.S. Zone Unchanged

Washington

• • • **The military government** of the United States Zone in Germany reports that production of pig iron in that zone during the week ended Aug. 3, was 5100 metric tons, unchanged from the preceding week. Steel ingot output declined to 4200 tons from 4800 tons, while finished steel production rose to 3650 tons from 1900 tons. Two thousand tons of steel were to be supplied the U. S. Zone for the manufacture of ball bearings for the Soviet Zone.

The Inter-Allied Reparations Agency, the report said, has allocated additional plants in the U. S. Zone to western nations. From Wuerttemberg-Baden, Belgium was allocated the Boehne and Koehle machine tool plant; and Czechoslovakia and the United Kingdom share the Fritz Miller machine tool plant.

The Coordinating Committee has agreed to ask the agency and the Soviet Union for declarations of interest in nonferrous metals plants in excess of capacity to be retained and to proceed with evaluations of these plants. Reservation was made that dismantling will await unification of Germany.

The report said that 35 pct of all freight cars in the U. S. Zone need repair compared with 29 pct in the British Zone and 34 pct in the Soviet Zone. Ten percent is considered normal.

WAA Announces Lease And Sale of War Plants

Washington

• • • **Purchase of** a war plant at Milwaukee by the firm which operated it during the war, the Pressed Steel Tank Co., for $769,506, has been announced by WAA. It will be converted from manufacture of steel rims for war vehicles to the production of gas cylinders, air compressors, and deep drawn stampings.

At the same time, it was announced that the Master Tool Co. of Cleveland had purchased the Ferro Enamel Corp. plant at Bedford, Ohio, for $78,750. The new owner will convert it from making magnesium powder to manufacture and repair of air tools.

Sale for $1,750,000 of a government-owned aircraft parts plant, operated during the war by United Aircraft Corp. in East Longmeadow, Mass., has been approved by WAA. The plant was sold to the Package Machinery Co., Springfield, Mass., which will use it for the manufacture of automatic wrapping and bottle hooding machines.

WAA announced also that the Bohn Aluminum Brass Corp., has leased additional government-owned equipment in an Adrian, Mich., plant now under lease to the Bohn Corp. Equipment leased to the Bohn Corp. consists of two furnaces, three presses, and a pressure station which were installed by the government at a cost of more than $1,200,000. The lease was for 10 yr with rental terms based on production and established minimums.

Expert Loaned to CPA

Washington

• • • **Captain H. A. Ingram,** USN, of Paoli, Pa., is on loan to CPA to work on the shipbreaking phase of the recently started iron and steel scrap drive, Administrator J. D. Small announced on Aug. 16.

Several months may elapse before the shipbreaking program can gain momentum Captain Ingram said. Representatives of the War and Navy Depts., the Maritime Commission, the War Shipping Administration, WAA and Office of Price Administration have been invited by CPA to help work out the program.

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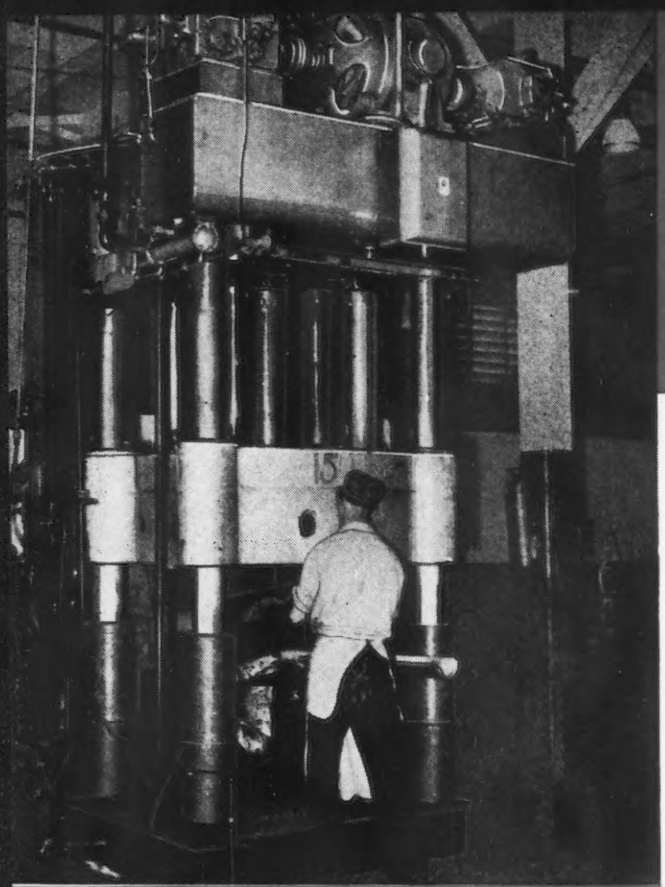

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